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MENTAL ALLERGY

REPORT OF A CASE OF SEBORRHEIC ECZEMA WITH RECURRENCES DEPENDENT ON THE EMOTIONAL BACKGROUND *

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Canst thou not minister to a mind diseas'd,
Pluck from the memory a rooted sorrow,
Raze out the written troubles of the brain,
And with some sweet oblivious antidote
Cleanse the stuff'd bosom of that perilous stuff
Which weighs upon the heart?

So speaks Macbeth one morning to his family doctor, ministering in vain to the insomnia of Lady Macbeth, "troubled with thick coming fancies, that keep her from her rest." Substituting the skin for the heart, the quotation becomes applicable to a phase of dermatologic research that may outstrip in interest for the moment the miasmic fog from the laboratory, which has blotted out so effectively the incentive to keen clinical observation by the physician and the individualism of the patient in a welter of biopsy, culture and test tube therapy. It may well be that the rôle of research, so long played by the laboratory scientist dealing in impersonal deductions, will be again assumed by the humanist whose interest primarily is in interpretative clinical deductions of the dermatologic problems of the individual.

The series of articles by Stokes [1] and his associates on "The Effect on the Skin of Emotional and Nervous States" bids fair to be the cornerstone on which may be erected a structure of theories and clinical observations of far-reaching consequences. It appears to be a bit of poetic justice that this same gifted gentleman who recently dubbed the practitioner wilfully isolating himself from research a "dermatician" rather than a "dermatologist" should be opening the doors of new and splendid opportunity to that erring brother for clinical study in a field in which he has special aptitude.

The mental allergies can be said to fall readily in two general classifications. The first group is the one in which the mental disturbance acts on the skin through the intervening agency of other organs. Thus the tired, overworked, nervous and sexually unsatisfied school teacher

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1. Stokes, John H., and Pillsbury, D. M.: The Effect on the Skin of the Emotional and Nervous States, Arch. Dermat. & Syph. **22**:962 (Dec.) 1930.

of 45 comes to the dermatologist with indigestion, constipation and menstrual woes, combining to produce the ever recurrent acne rosacea. In the chronic urticaria the connecting links between the emotions and the wheals may be gastro-intestinal disturbances of the hypofunctional type. The combination of emotional stress and definite subacidity has been noted by numerous observers in series of eczema, pruritus, neurodermatitis, acne vulgaris, psoriasis and dermatitis herpetiformis. In this group the story of the patient forces attention to the obvious dysfunction of other organs as well as the skin. But only in proportion to the recognition and correction of the mental factor does the proper therapy for the physical dysfunctions give permanent relief.

In the second group distress of mind results directly in distress of skin without other organic dysfunction. At least, if other organic dysfunction is present, the practical results are so insignificant as to cause no demonstrable changes or perceptible distress.

Some of the cutaneous phenomena resulting from mental stimuli are so common that the interrelationship is recognized without comment, even by the layman. The clammy hand and the cold ooze on the brow reveal to the discerning eye the embarrassment and nervousness of the possessor. Blushing, that mentor of maidens' modesty now fast departing to the realm of folk lore, has ever been the signal of the peace of mind destroyed.

The coincident occurrence of major cutaneous disorders and mental stress has been noted and accepted, but definite proof that their appearance is due to a sensitization reaction to what might be called "mental proteins" is obviously impossible. No metes or bounds can be set by the physician to measure the volume and the pressure of a mental disturbance on the possessor. No method has been devised to introduce mental distress in fractional doses into the system so that its effect on the dermatosis can be studied. It is all a question of interpretative analysis, qualified both consciously and unconsciously by prejudices of the individual dermatologist, ill trained at present to assume the impartial rôle of the psychologist.

At present the evidence concerning the effects of mental allergy is full of conflicts and inconsistencies. White [2] showed, in a long series of cases of lichen planus in his private practice, that at least 75 per cent have a history of concurrent worries and fears of many types. On the other hand, at the last meeting of the Atlantic Dermatological Conference in Boston, both Dr. Oliver of Boston and Dr. Burgess of Montreal, speaking informally, said that they could not recall a single case of lichen planus coming under their observation among the overseas soldiers in the World War.

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2. White, Charles J.: Lichen Planus: A Critical Analysis of Sixty-Four Cases, J. Cutan. Dis. **37**:671 (Oct.) 1919.

O'Donovan [3] said: "It is my opinion that a majority of the cases of alopecia areata are psychic in their origin and that this overwhelming nervous factor has not been estimated at its full value owing to the rate at which dermatological practice has to be conducted." Yet this clearcut clinical entity presents itself in the care-free child as well as in the adult with the burdened mind. Indeed, the same adult, long freed from the mental phase and with hair restored, returns at widely separated intervals with a recurrence undistinguishable from the first attack.

The gesture of scratching the head and other parts of the body vigorously when in perplexity or in reflex sympathy on seeing another scratch may be a trivial manifestation of the basic principle back of such major conditions as generalized pruritus or chronic eczema. Stokes [4] gave the details of three cases of pruritus with other complications in which he considered a sexual psychosis an element in the maintenance, if not the actual origin, of the itching. In discussing pruritus ani, O'Donovan [3] said that "in the great majority of cases it is impossible to find by local examination an adequate cause for the patient's complaint"; he considered it to be neurotic in origin. Hazen and Whitemore [5] expressed the belief that a large proportion of cases of pruritus vulvae have an unfortunate sexual background.

The following case is one of a routine, widespread, recurrent seborrheic eczema, the exacerbations of which definitely followed consistently related severe emotional stress throughout the course of the cutaneous outbreak.

REPORT OF A CASE

Mrs. A. was 30 years of age when first observed, in 1928. The periods of her life fall naturally into three different groups, each with a distinctly different mental and physical setting.

She was the daughter of an elderly father, who was widowed early in her life, and she was brought up in the strictly Victorian atmosphere of this gentleman and a maternal grandmother of advanced years. Until the time of her marriage her physical life was entirely free from serious illness. She was a natural blond, and her skin had always reacted easily to minor irritations. She recalled numerous instances of transient rashes which at the time of their occurrence had been attributed to errors of diet, heat, sunburn, etc. From 5 to 12 years of age, she had yearly attacks of hay-fever that cleared up spontaneously.

Throughout these early sheltered years, obedience to the desires of her father and grandmother was implicit, and independent analysis and action were not considered. As she possessed a keen mind, her taste developed along literary lines, and she graduated from college with a Phi Beta Kappa ranking. Considerable biologic study had made her entirely familiar with the natural facts

3. O'Donovan, W. J.: Dermatological Neuroses, London, Kegan Paul, Trench, Trubner & Company, 1927.

4. Stokes, John H.: The Effect on the Skin of Emotional and Nervous States, Arch. Dermat. & Syph. **22**:803 (Nov.) 1930.

5. Hazen, H. H., and Whitemore, E. R.: Skin Diseases Due to Emotional Disturbances, Arch. Dermat. & Syph. **12**:261 (Aug.) 1925.

of life in a theoretical way, but her limited contact with the world in general made her totally inexperienced in their practical application.

In the last year of her college life she made the acquaintance of the man whom she married. This acquaintanceship developed into a casual friendship with a mild romantic touch. At this time the family financial fortune began to ebb, and this, combined with a realization on the part of the father and grandmother that their years were drawing rapidly to a close, spurred them both on to urge this girl to marry in order that she might achieve relative financial security. As a result of their insistence, her lifelong obedience to her father's wishes and the lack of definitely opposing personal desires, she married Mr. A. in 1921. He turned out to be a man who though godly in the church was devilish in the home, and had the sexual appetite and technic of the English sparrow.

The brief week of honeymoon was a combination of acute tonsillitis, menstruation and a repeatedly insistent husband. With such an introduction, her married life developed into a never ending series of dutiful acquiescences to a husband who became increasingly critical of her own emotional lack. An early pregnancy with a therapeutic abortion for pernicious vomiting at the end of four months contributed much to the woes of those early months. Mr. A. decided to indulge in several years of postgraduate work. To further this end, Mrs. A. contributed her own slender capital, and through part time teaching, lecturing and writing took up the major portion of the burden of their support. Although Mr. A. finally acquired a professional position with a reasonable salary, his irresponsible financial habits kept the wife fighting ever increasing embarrassment and debts. Paying the long overdue installments on her own engagement ring, for instance, would bring humiliation to many a woman far less emotionally sensitive than Mrs. A.

In 1922, a year after her marriage, typical hay-fever developed, which recurred with more or less severity every summer, from the middle of August until the first frost. This allergic reaction started before the cutaneous outbreaks, continued without perceptible effect on them, and occurred with similar regularity and intensity after the skin cleared up. During these early years she also suffered for the first time from repeated attacks of indigestion and hyperacidity, which she definitely recognized as being in direct proportion to her fatigue, discouragement and nervousness. It is interesting to note that with the onset of the cutaneous outbreak this indigestion, which had been a constant factor for several years, cleared up entirely and did not return.

With such a background, the first eruption appeared in the spring of 1926, on the flexors of the elbows, inside of the wrists and backs of the knees and between the scapulae. Financial woes and sexual incompatibilities became so acute that Mrs. A. went to a distant city apart from her husband to do some research work and teaching.

At this time she was doing considerable gardening, and her local physician thought that the eruption was due to irritation by a plant. It was never determined what plant in her flower garden was to blame, and treatment was only partially effective. During her absence in the summer the same line of treatment was pursued, and the eruption disappeared entirely. This summer was happy as she was free from the demands of her husband and from financial worries, and was doing work in which she took a great deal of personal pleasure. As far as their sexual relations were concerned, she accepted her husband's word that the abnormality was on her side, and she determined that on her return home she would change her own failure, as she conceived it, into success. To this end she saw an excellent psychologist who gave her good advice which they both hoped would dispel her sense of failure and enable her to meet the demands at home with

reasonable success. These excellent theories, however, did not work out in practice, and within a month after her return home her general domestic relations were as bad as ever.

The same type of eruption returned in the fall of 1926, and this time a new black crepe satin dress was blamed for the outbreak. The dress was discarded, but in spite of all treatment the lesions continued until the fall of 1927. At this time the combination of a year of outbreak and itching and her relations with her husband, which had become complicated by his attention to a friend of the family, resulted in a complete nervous collapse which made treatment in a hospital necessary.

During her stay of several months in the hospital a careful study of the cutaneous condition was undertaken, which yielded essentially negative results. The various laboratory tests, including that of basal metabolism and the Wassermann test, showed nothing beyond a mild secondary anemia. Microscopic and cultural examinations for fungi were negative as were cutaneous tests for possible food allergies. As might be expected from the history of hay-fever, the autumnal pollen tests were positive. At this time the patient experienced profound mental depression, accompanied by insomnia, nightmares and occasional thoughts of suicide. There was slow improvement of the mental condition, and the eruption disappeared gradually, although the local remedies were those used without the slightest success during the year preceding the period in the hospital. Her return home meant the resumption of the same old burdens; within eight weeks, the eczema was as severe as before, this time involving the scalp, ears, neck, shoulders, arms, knees, groins and scattered areas on the body.

The spring of 1928 was one long series of cutaneous and domestic eruptions. The question of separation was not easy to meet, as divorce would have a serious effect on her husband's professional career. Her father urged her strongly to continue with the husband, as his knowledge of the true conditions was meager, and he could foresee the difficulties of her having to provide her own livelihood. The death of her father and the absolute depletion of her own resources by the husband brought things to a climax, and in the late spring of 1928 she left her husband and went to Boston to make her own living.

It was at this time that she came under my care. My first examination showed a typical seborrheic eczema involving the left ear, the interscapular region, both wrists and both axillae.

Freed from her husband with his sexual and financial problems, the patient found herself in a new environment with only a few casual acquaintances, and faced with the dual problem of earning her own livelihood and keeping her skin sufficiently presentable to be able to work if she found employment. Under ordinary conditions the problem of a cultured but untrained woman is difficult, but hampered with a severe and extensive dermatosis plus an overwhelming sense of past failure, her economic position was precarious in the extreme. A fortunate opening placed her as a saleswoman in a department store with long hours and hard work at a minimum wage. The next eight months were spent in a battle to keep her skin presentable and under control and to increasing her efficiency. She was promoted from a saleswoman to a forewoman in charge of a department, which brought with it added responsibility of an exacting nature and a still keener necessity for an attractive personal appearance as far as any visible disease of the skin was concerned. The end of the winter found her with the skin about 75 per cent improved and a steadily diminishing reserve of vitality. Bodily fatigue and business criticisms produced an increasing round of rehearsals of the troubles of her married life, with self-blame for its failure and diminished self-confidence in her ability to achieve relative financial security. An attack

of tonsillitis and influenza put her in bed for a month and settled the question of continuing work for the time being. From the financial point of view, this was not an absolute loss, as she was able to go on the corporation's sick benefit list for a period of six months. The rest in bed and the following period of leisure with comparative freedom from acute financial worries resulted in a practical clearing up of the eruption. By the end of June, 1929, the affected areas showed only slight redness and scaling, with a tendency toward a reaction to friction, such as scratching or the rubbing of clothes.

At this point, when the patient's general health was excellent, her emotional state calm and poised, and the skin in the best condition that it had been for over a year, Mr. A. came to Boston for a conference in regard to their coming divorce. The meeting with him passed off pleasantly enough, and at the time she was not conscious of any emotional strain. Forty-eight hours after the conference, the patient said, the whole picture of her unhappy marriage, which had been pushed into the background, began to recur constantly in her mind. She was unable to put out of her thoughts all the various disturbing details. She was aware that as these thoughts continued, her skin became more itchy and red. The final straw in this situation was the receipt of a letter from an elderly lawyer, who had been a lifelong friend of her father, in which he declined to continue as her counsel in the coming divorce proceedings on account of religious scruples. In less than a week a relatively normal condition of the skin developed into an acute dermatitis. The face, ears and neck were greatly swollen, red and oozing, and milder and similar outbreaks appeared over various parts of the body. This attack was more severe, extensive and acute than any previously experienced.

To see the good results from weeks of patient treatment disappear in a few days for no apparent physical reason was bitterly discouraging to the patient. As had been the case throughout her entire illness, it seemed as if the skin had the power to break out at will. The patient was transferred to the care of Dr. Frederick S. Burns, who concurred in the diagnosis of seborrheic eczema. Again a detailed study of her life and environment failed to reveal any possible physical factor which could be suspected of being the direct external cause of the dermatitis. That the correlation of the patient's emotional disturbances and the cutaneous outbreaks was of more than coincidental importance was gradually forced on us and rather reluctantly accepted as the probable etiology of the disease. The patient received this explanation sympathetically, and made every endeavor to put out of her mind all thoughts of the past. Eight weeks of treatment of a constantly soothing nature cleared up the outbreak entirely, and this recovery continued for two months.

While driving an automobile one afternoon, the patient had a narrow escape from a serious accident when an oncoming car which threatened her safety crashed into a car just behind her with serious consequences to the two other drivers. It was the kind of escape that leaves any one shaky and weak in the knees from sheer fright. Within forty-eight hours the skin became red, itching and swollen, especially about the ears and neck, but the previous acute outbreak did not eventuate, and the attack quieted down within ten days. This is the only occasion on which a radically different type of emotion reacted on the skin.

A month later it was necessary for her to take the witness stand in court in her uncontested divorce trial and tell many of the unsavory details of her married life. She was able to recite her story to the judge effectively, although keenly conscious of emotional strain. For the next two days digestion seemed to stop, and the distress was not relieved until after several attacks of vomiting. The eczema again flared up with the same intensity and duration as after the automobile accident.

In the early spring of 1930, she undertook teaching and research work along lines in which she was keenly interested, which decidedly relieved the financial situation. Her daily contacts now were with people of her own educational and social standing. The congenial atmosphere of teaching in college, in comparison with the conditions in a large department store, gradually restored her self-confidence and faith in her own ability to make her way successfully. Her mental, physical and dermatologic condition prospered.

The final outbreak of eczema occurred after an interval of several months of complete freedom. She attended a well known religious Easter pageant. Under the spell of the deep emotional quality of the service which lasted for several hours, she began to review the events of the past. Memory recalled the death of her father, her deep interests in religious work and the utter failure and waste of her married years. She said that the end of the service found her under an oppressive blanket of emotional depression, with a revived sense of personal failure. Within twenty-four hours a routine outbreak of eczema began as before, and in three days the face, ears and neck were swollen to twice their normal size, with accompanying oozing and crusting. The rest of the body was spared, with the exception of slight outbreaks on the elbows and under the knees. Recognizing the source of the trouble, the patient took absolute rest in bed for a week, and under the use of local soothing treatment the attack cleared up within six weeks. A year has elapsed since the last recurrence. Lacking any definite emotional crisis reminiscent of her previous troubles, she has had no further cutaneous outbreak.

SUMMARY AND CONCLUSION

Two distinct pathologic conditions were found in this case. Dermatologically, the skin presented a typical picture of seborrheic eczema, severe, persistent, extensive and recurrent, in a person with a background of cutaneous sensitiveness and the allied allergic reaction of hay-fever.

Through the steady pressure of an accumulated mass of unjustified criticisms and degrading and embarrassing circumstances, the patient's emotional stamina became profoundly depressed, with a resulting marked inferiority complex. The reaction to the unfortunate sexual conditions expressed itself in terms of a lowered ego valuation, rather than permanent sexual inhibitions or fears.

ABSTRACT OF DISCUSSION

Dr. Joseph V. Klauder, Philadelphia: This case report emphasizes what the well balanced clinician knows, namely, the importance of evaluating the personal make-up of the patient, his temperament, environment, etc., in a consideration of the disease picture, which may or may not be a cutaneous one. Much has been written in this regard; the one book that comes to my mind now is that of Peabody, "The Art of Practicing Medicine." We all know that the sympathetic nervous system is intimately concerned with the phenomenon of inflammation and that the skin contains a greater number of nerve endings than any other organ. A few years ago, in the preparation of my report, "The Cutaneous Neurosis," I reviewed the literature in this regard and cannot now recall a similar case to that reported by Dr. Blaisdell. A possible exception, if my memory serves me correctly, is a case report in Dr. George Henry Fox's "Atlas of Skin Diseases," concerning a patient with seborrheic dermatitis of the scalp, the activity of which varied in relation to the rise and fall of the stock market.

DR. HOWARD FOX, New York: Dr. Blaisdell has given a very complete and interesting history of his case of seborrheic eczema. He has demonstrated the effect of emotions on what is thought by many to be an infectious disease, quite possibly due to fungi. According to McLeod, seborrheic eczema is due to an infection with a yeast, the spore of Malassez. If this is true it is hard to understand how a fungous infection could be affected in such a marked degree by mental impressions.

DR. SIGMUND POLLITZER, New York: Assuming that this case was a seborrheic eczema, it is readily comprehensible that an emotional disturbance that influences particularly the vasomotors of the face would necessarily have an influence on the eczema, the germ of which may lie dormant in the affected areas for a long time. The recurrences are readily explicable and do not require the objectionable term "mental allergy."

DR. JOSEPH GRINDON, St. Louis: I feel ready to accept the conclusions suggested in Dr. Blaisdell's paper. The effect of the emotions on the skin has been known for years; Shakespeare knew of it, when he spoke of "a green and yellow melancholy." Last year Dr. Stokes gave us some seed thoughts on the subject: how even a pus infection can be influenced by the hydrogen ion concentration of the affected area of the skin. How this in turn can be influenced by suggestion was suggested. This is all quite in line with what most of us will admit. I am glad that it was brought out in this way by Dr. Blaisdell.

DR. KARL G. ZWICK, Cincinnati: Personally I would have preferred the title of the paper to read: "Psychic Analogue of Allergy," as perhaps more closely indicative of the salient feature of the case report.

The literature contains a series of papers on the differential chemistry of the neuroses and psychoses.

There is no dearth of work on the relationships of mental and emotional phenomena to body chemistry, and that a change in the chemistry of the body and its integument may play a rôle in the genesis of pathologic cutaneous manifestations is to be expected. A change of the terrain may also pave the way for infections or, as I have pointed out in my paper today, their cure. According to McLeod, as Dr. Fox mentioned, seborrheic dermatitis is due to an infection. This, according to Dr. Fox and, if I understand him correctly, also according to Dr. Pollitzer, excludes an emotional factor in the pathogenesis of seborrheic dermatitis. But emotional phases influence qualitatively the cutaneous secretions or excretions and therefore also the terrain which constitutes the habitat of the infectious agents.

DR. J. HARPER BLAISDELL, Boston: I wish to express my appreciation of this discussion. It seems to me as if on one end of the road was the very definite emotional stress, and on the other end of the road the very definite cutaneous manifestation. What went on between those two ends I am not prepared to say, but I think that the emotional stress was the thing that pulled the trigger. Sequelae are interesting and in this case particularly so. This patient remained well from last spring to this spring. On a Saturday she received a letter from her husband stating that he was coming to discuss some property. On Saturday night her skin was red and itchy and on Sunday morning it was swollen and markedly inflamed. The outbreaks lasted for eight weeks.

PHYSICAL THERAPY IN DERMATOLOGY

AN APPRAISAL BASED ON RESULTS IN PRACTICE *

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Between October, 1921, and January, 1931, I treated 7,206 private patients. Of this number, 3,541 (49.1 per cent) received some form of physical therapy, as indicated in table 1.

My equipment has consisted of: (1) a roentgen machine with an 8 inch (20.32 cm.) maximum point gap and a medium focus Coolidge tube, (2) a portable telatherm for electrodesiccation and coagulation, (3) a Kromayer mercury arc water-cooled quartz lamp, (4) an electrolytic outfit and (5) 10 mg. of radium in a half-strength flat-glazed applicator.

TABLE 1.—*Number of Patients Treated by Physical Therapy*

	Number	Per Cent
Patients treated by roentgen rays	2,570	72.5
Patients treated by desiccation	812	22.9
Patients treated by electrolysis	76	2.1
Patients treated by radium	19	0.5
Patients treated by ultraviolet rays	64	1.8

In roentgen treatment, the technic and measurement of dosage of MacKee [1] were always used, and throughout this paper the word "unit" refers to MacKee's standard of dosage. The factors for a 1 unit dose were: 3 milliamperes, a 6 inch spark gap, a distance of 8 inches (20.32 cm.) from the target to the skin, and two minutes' time. A filter was seldom used. In electrodesiccation and coagulation the technic described by Wyeth [2] has been used, an ordinary sewing needle serving as the working electrode.

All of the reported observations were made on private patients. Some of the diagnoses were confirmed by laboratory examinations, but most of them were purely clinical. In most cases, in order to secure the quickest possible relief, supplementary treatment was given, both local and systemic, and sole reliance was not placed on physical therapy.

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1. MacKee, G. M.: X-Rays and Radium in the Treatment of Diseases of the Skin, ed. 2, Philadelphia, Lea & Febiger, 1927.

2. Wyeth, G. A.: Surgery of Neoplastic Diseases by Electrothermic Methods. New York, Paul B. Hoeber, Inc., 1926.

A large number of these patients have been followed up after their discharge, but this has not been possible in all instances. Therefore, the chief emphasis will be placed on the immediate results of treatment, as noted in my office.

TREATMENT BY MEANS OF ROENTGEN RAYS

Patients with acne vulgaris were usually treated with the roentgen rays. In addition to this, treatment was usually given for the coexisting

TABLE 2.—*Results in the Treatment of Patients with Acne Vulgaris.*

Age	17 and Under		18 to 20		21 to 25		26 and Over		
Sex	Male	Female	Male	Female	Male	Female	Male	Female	Total
Number starting treatment.	67	57	73	95	47	125	15	114	593
Number stopping prematurely	21	9	32	19	17	31	7	31	167
Number stopping when improved	3	2	1	6	1	7	1	6	27
Number completing treatment	43	46	40	70	29	87	7	77	399
Number cured with one course	37	37	30	61	21	76	6	67	335
Percentage	86.0	80.4	75.0	87.1	72.4	87.3	85.7	87.0	84.0
Aver. treatments to cure in one course without recurrence	12 (13 weeks)	12.1 (13 weeks)	12 (13 weeks)	12 (13 weeks)	13 (13 weeks)	11.76 (13 weeks)	9.66 (11 weeks)	12.53 (14 weeks)	11.75 (13 weeks)
Number recurring once	3	5	8	2	6	8	1	9	42
Percentage	7.0	10.8	20.0	2.8	20.7	9.0	14.3	11.7	10.5
Number recurring twice	3	2	0	3	0	1	0	0	9
Percentage	7.0	4.3		4.2		1.1			2.2
Number recurring 3 times	0	1	1	1	1	2	0	0	6
Percentage		2.1	2.5	1.4	3.4	2.3			1.5
Number recurring 4 times	0	0	1	0	0	0	0	0	1
Percentage			2.5						0.25
Number recurring 5 times	0	0	0	0	0	0	0	1	1
Percentage								1.3	0.25
Total recurrences	6	8	10	6	7	11	1	10	59
Percentage	14.0	17.4	25.0	8.5	24.0	12.6	14.3	13.0	14.7
Failures	0	1	0	3	1	0	0	0	5
Percentage		2.1		4.2	3.4				1.2

seborrhea capitis; sugars and fats were strictly excluded from the diet, with concessions when needed to prevent undesirable loss of weight, and general hygienic measures were instituted. No local applications were prescribed, and the use of greasy toilet preparations was forbidden. The usual dose of roentgen rays was one-fourth unit, unfiltered, according to MacKee, and treatments were given every seven days, every fifth or sixth one being omitted, in order to prevent too great cumulative action. The results of treatment have been tabulated according to age and sex (table 2).

It was noted that a number of the cases became aggravated during the first three or four weeks of treatment. After this temporary exacerbation the condition cleared up uneventfully.

Most of the recurrences were apparently due to errors in diet, and were quickly cured when these were corrected. Some were due to irregularity of treatment, which necessitated a somewhat greater total number of exposures to complete the tardy cure. In several cases, cysts recurred for which treatment had to be given. Usually the recurrences were mild, and the additional treatment was limited strictly to the parts affected, every fourth or fifth treatment being omitted. The data in table 2 indicate that acne in children is not more stubborn than that in older patients.

Patients with rosacea were treated by regulation of the diet, attention to the seborrheic scalp and general hygienic measures, usually with the aid of roentgen rays administered exactly as in the cases of acne vulgaris. The results of treatment are given in table 3.

The recurrences were mild and apparently were due to errors in diet, especially the abuse of alcohol. Of the eight failures, three cases

TABLE 3.—*Results in the Treatment for Rosacea*

Number of patients treated	127	
Number of males treated	47	
Number of females treated	80	
Number stopping prematurely	44	
Number finishing treatment	83	
Number of cures in one course	71	(85.5%)
Average number of treatments required to cure in one course	13.23	(14 to 15 weeks)
Number of recurrences	4	(4.8%)
Number of failures	8	(9.6%)

cleared up after cholecystectomy, while in two, the patients had stubborn sinus and tonsillar infections. The remaining three cases were of the purely erythematous type, which fortunately was not frequently encountered in this series. As in acne vulgaris, the eruption frequently became aggravated during the first few weeks of treatment, apparently due to some action of the rays; however, these patients recovered completely, as a rule, in the average length of time.

In the cases of sycosis vulgaris and folliculitis barbae, the value of irradiation did not seem to exceed 40 per cent, and much better results were obtained by the regular use of local applications under strict supervision. Permanent epilation was not attempted, and although temporary epilation was done in only three of the forty-three cases, it appeared to be effective only once. I have seen sycosis persisting in areas atrophic from previous irradiation. Of fifteen patients treated without the rays, twelve were cured in a few weeks, and two in whom one recurrence took place were also finally cured. One patient discontinued treatment too early for comment.

For patients with folliculitis nuchae and axillaris, fractional irradiation seemed more valuable, and was always used in combination with

mild local antiseptic treatment. Four of eight patients with folliculitis nuchae received roentgen treatment in one-fourth unit doses. One was cured after twelve treatments, and another after fifteen; neither had recurrences. A third patient seemed to be cured after five treatments and a fourth after four, but both had recurrences within a few months; the recurrences cleared up, like the cases of sycosis, without further irradiation, under local applications of alcohol and gradually strengthened ointments of ammoniated mercury and salicylic acid in benzoinated lard. Three other patients were also cured following the application of the antiseptic ointments, without irradiation.

Three patients with acne keloid were treated. One stopped treatment prematurely. A second patient was improved and stopped after six weeks of semi-intensive treatment. In the third patient, the condition resisted twelve one-half unit doses, and finally thirteen 1 unit doses, closely limited to the individual lesions, were needed to complete the cure.

Probably owing to midwestern climatic peculiarities, irradiation has not been needed in the treatment for tinea tonsurans. All patients have been cured with local applications containing iodine or thymol. Used in conjunction with mild parasiticidal applications, fractional doses of roentgen rays seemed to hasten the cure of several stubborn eczematoid patches of tinea corporis, and appeared to be of some help in similar, but deeper and more resistant, lesions of bovine origin, due to *Trichophyton ochraceum*. However, similar conditions cleared up almost as promptly when stronger parasiticides were used instead of irradiation. The same may be said of tinea cruris, which, in my series, responded well to mild parasiticides and required no irradiation. In four cases of tinea unguium of the fingers, semi-intensive (one-half unit) doses were used every two weeks, together with potassium permanganate and mild ointments of thymol. In two cases of several years' duration, the patients were not improved after five or ten one-half unit doses. One patient, in whom the condition had been present for a year, was cured after six such treatments, and another, in whom the condition was of two months' duration, was cured after six treatments, given at irregular intervals so that their real value was somewhat doubtful. In a stubborn case of sporotrichosis, five 1 unit doses of the rays, with iodides internally, completed the cure.

In dermatophytosis fractional irradiation was often employed, especially in cases of the eczematoid variety, always in combination with mild parasiticidal applications, such as potassium permanganate and preparations of thymol, frequently combined with 2 per cent salicylic acid. The results are shown in table 4.

Although the feet had been examined in all cases, perhaps infection of the feet was present more commonly than the figures in table 4 seem to indicate. But when the hands alone were treated, the results

were surprisingly good, in comparison with the other two groups. Perhaps this was due to the favorable action of the rays on eczematoid eruptions, regardless of etiology. However, if the infection of the feet had been present originally and treatment had not been given, because undiscovered, a greater number of recurrences on the hands would be expected. Of course, other possible etiologic factors were carefully excluded, but there is a possibility that some of the eruptions on the hands diagnosed clinically as dermatophytosis, in the absence of positive microscopic and cultural observations, were really due to other causes.

Persistent infection of the toe-nails, which resisted irradiation, appeared to be the chief stumbling block and probably caused many

TABLE 4.—*Results in the Treatment of Patients with Dermatophytosis*

1. Location of eruption	Hands and Feet	Feet Alone	Hands Alone	Total
2. Number of patients given irradiation	184	109	220	513
3. Number cured with one course (with no known recurrence)	106 (57.6%)	69 (63.3%)	139 (63.0%)	314 (61.2%)
4. Number relieved with one course (with no known recurrence)	22 (11.9%)	12 (11.0%)	21 (9.7%)	55 (10.7%)
5. Number cured and relieved with one course (3 plus 4)	128 (69.5%)	81 (74.3%)	160 (72.7%)	369 (71.9%)
6. Average number of treatments for cure without recurrence	9.5 (10-11 weeks)	8.0 (9 weeks)	7.7 (8-9 weeks)	8.4 (9 weeks)
7. Number cured after one recurrence	22 (12.0%)	13 (11.9%)	31 (14.0%)	66 (12.8%)
8. Number relieved after one recurrence	5 (2.7%)	0	6 (2.8%)	11 (2.1%)
9. Number cured and relieved after one recurrence (7 plus 8)	27 (14.7%)	13 (11.9%)	37 (16.8%)	77 (15.0%)
10. Number cured after two or more recurrences	10 (5.4%)	5 (4.6%)	12 (5.4%)	27 (5.2%)
11. Total recurrences (9 plus 10)	37 (20.1%)	18 (16.5%)	49 (22.2%)	104 (20.2%)
12. Number relieved after two or more recurrences (failures)	6 (3.2%)	0	1 (0.4%)	7 (1.3%)
13. Other failures	13 (7.0%)	10 (9.0%)	10 (4.5%)	33 (6.4%)
14. Total failures (12 plus 13)	19 (10.2%)	10 (9.0%)	11 (4.9%)	40 (7.7%)

of the failures. Impaired circulation due to varicose veins also accounted for several failures, the eruption clearing up when this condition was corrected. Most of the eruptions in which irradiation had failed, cleared up later under stronger ointments, containing thymol and from 3 to 8 per cent salicylic acid. Several patients seemed overtreated, and improved when an ointment of boric acid was applied.

Six patients with stubborn infectious eczematoid dermatitis, in various locations, were cured after the administration of from three to nine (averaging five) one-fourth unit doses, together with rubbing alcohol and 2 per cent ointments of ammoniated mercury.

Patients with localized neurodermatitis and lichenification usually received fractional irradiation plus mild antipruritic ointments. The clearcut cases were classified as true neurodermatitis, while those developing secondarily to seborrheic dermatitis, tinea, dermatitis venenata,

eruptions of allergic origin, occupational dermatoses, erythema toxicum, varicose dermatitis, senile pruritus and pruritus ani, vulvae or scrotalis were classified as cases of lichenification. Table 5 shows the results of treatment in these cases.

Although one patient with localized neurodermatitis required seventeen treatments, the condition finally responded; no failures were recorded in either group. Localized recurrences responded favorably to irradiation, but, of course, tar and other remedies may have to be substituted at times if lesions recur too frequently in the same location.

TABLE 5.—*Results of Treatment in Cases of Neurodermatitis and Lichenification*

Diagnosis	Neurodermatitis	Lichenification
Number of patients treated	71	148
Number cured of one outbreak	56 (78.8%)	124 (83.7%)
Number cured of two outbreaks	9 (12.6%)	12 (8.1%)
Number cured of three outbreaks	3 (4.2%)	7 (4.7%)
Number cured of four outbreaks	1 (1.4%)	3 (2.1%)
Number cured of five outbreaks	1 (1.4%)	2 (1.3%)
Number cured of six outbreaks	1 (1.4%)	0
Total recurrences	15 (21.2%)	24 (16.3%)
Average number of treatments to cure in one course	6.5 (6 weeks)	5.6 (5 weeks)
Failures	0	0

TABLE 6.—*Results in the Treatment for Seborrheic Dermatitis*

Sex	Males	Females	Total
Number completing treatment	107	221	328
Number cured with one course	78 (72.9%)	180 (82.5%)	258 (78.6%)
Number with one recurrence, cured	16 (14.9%)	20 (9.1%)	36 (11.0%)
Number with two recurrences, cured	6 (5.6%)	8 (3.6%)	14 (4.2%)
Number with three recurrences, cured	2 (1.8%)	8 (3.6%)	10 (3.0%)
Number with four recurrences, cured	1 (0.9%)	1 (0.4%)	2 (0.6%)
Number with five recurrences, cured	0	1 (0.4%)	1 (0.3%)
Number with six recurrences, cured	0	0	0
Number with seven recurrences, cured	1 (0.9%)	0	1 (0.3%)
Total recurrences	26 (24.1%)	38 (17.1%)	64 (19.4%)
Average number of treatments per course	5.2 (4-5 weeks)	4.9 (4 weeks)	5 (4 weeks)
Failures	3 (2.8%)	3 (1.3%)	6 (1.8%)

Eleven cases of generalized neurodermatitis were encountered, with their usual stubborn characteristics and persistent tendency to recur in spite of treatment. All of the patients were helped by roentgen rays from time to time, but four cases have now been classified as failures. In dealing with such cases, too much reliance must not be placed on irradiation. Preparations of tar will often have to be substituted, to avoid undesirable sequelae, while the etiologic factors are sought.

Many patients with seborrheic dermatitis received irradiation, always accompanied by appropriate ointments, attention to the scalp and dietary restrictions. The results of treatment in these cases are shown in table 6.

In the cases recorded in table 6, the recurrences, although frequent, responded well to further treatment. However, too much repeated irradiation of any one area must be guarded against. Many recurrences may be avoided by continued attention to the scalp and diet after a cure has been effected.

Among the 246 cases of psoriasis observed, the scalp was found to be involved in at least 202 (81.2 per cent) patients. One-fourth unit doses of roentgen rays at weekly intervals were employed, and one-eighth unit doses for the scalp. Fifty-two patients stopped treatment prematurely, and nine did not receive irradiation. The results appear in table 7.

In all of the failures and in nine other stubborn cases, other forms of treatment were occasionally used. The lesions on the scalp responded

TABLE 7.—*Results in the Treatment for Psoriasis*

Number completing treatment	185
Number cured	177 (95.7%)
Number cured of one outbreak	109 (58.9%)
Number cured of two outbreaks	26 (14.0%)
Number cured of three outbreaks	12 (6.4%)
Number cured of four outbreaks	11 (6.0%)
Number cured of five outbreaks	5 (2.7%)
Number cured of six outbreaks	3 (1.6%)
Number cured of seven outbreaks	2 (1.0%)
Number cured of eight outbreaks	4 (2.1%)
Number cured of nine outbreaks (in a four year period)	1 (0.5%)
Number cured of ten outbreaks (in a three year period)	1 (0.5%)
Number cured of eleven outbreaks (in a six year period)	1 (0.5%)
Number cured of fourteen outbreaks (in eight and four year periods)	2 (1.0%)
Total recurrences	68 (36.7%)
Average number of treatments per course	5.7 (5 weeks)
Failures	8 (4.3%)

well to the one-eighth unit doses, and no defluvium was observed. In psoriasis, as in other recurring eruptions, too frequent courses of irradiation must not be used in any one area.

Fifty-nine patients with lichen planus were observed, the ages varying from 16 to 69 years. There were twenty-seven males and thirty-two females, and in all but seven the eruption was of less than one year's duration. Forty-four received at least one course of roentgen treatment. There were two failures (4.5 per cent) and forty-two cures (95.5 per cent). Thirty-nine were cured with one course (88.6 per cent), while three required two courses (6.9 per cent).

Of the forty-four patients treated, seventeen received local irradiation plus ointments. The cases comprised the milder and more localized eruptions. Sixteen (94 per cent) of these patients were cured with one course, averaging 4.3 treatments per course. In one patient (6 per cent) there was one recurrence, requiring two treatments to cure each outbreak. No failures were observed.

Sixteen of the patients received local fractional irradiation, ointments and intramuscular injections of mercuric salicylarsenate twice a week. These patients had severe, localized or generalized cases. Thirteen (81.2 per cent) of the patients were cured with one course, averaging 9.1 treatments to a course. (One cure in five treatments occurred in a case in which a local recurrence obtained four months after a generalized outbreak had been cleared up with spinal and local irradiation, without mercuric salicylarsenate.) In one patient (6 per cent) a recurrence occurred after four years, and the patient was cured by twenty-one local fractional treatments, supplemented, during the final month, with three one-half unit doses to the entire spine, and without the use of mercuric salicylarsenate. Treatment failed in two cases (12.5 per cent). One patient, a woman, aged 34, had general and local outbreaks of four months' duration, which recurred and resisted local irradiation and the injection of mercuric salicylarsenate. The other patient, a woman, aged 38, had a generalized hypertrophic eruption, the most severe case in the entire series, which resisted all forms of treatment, spinal therapy not being in use at that time.

Thirteen other patients received local fractional irradiation to the worst areas once a week, plus semi-intensive (one-half unit doses) unfiltered treatment of the entire spine (in two areas) at intervals of two weeks. These cases were all severe and generalized. Twelve (92.3 per cent) patients were cured with one course, averaging 6.8 one-fourth unit doses to the worst lesions and 3.86 one-half unit doses to the spine. In some local areas, to which irradiation was not applied directly, the condition cleared up under this treatment. (One cure, after twenty-one local one-fourth unit doses, supplemented with three one-half unit doses to the spine, was in a case recurring four years after having been cleared up with mercuric salicylarsenate plus eleven local irradiations.) In one patient (7.7 per cent) a recurrence took place after four months, and the patient was cured by five local one-fourth unit doses plus injections of mercuric salicylarsenate. There were no failures.

In the case of a woman, aged 58, who was under local plus spinal treatment, the condition was widespread and severe, of five months' duration. It had nearly cleared up after four weeks of treatment, when a sudden flare-up on the abdomen occurred immediately after an automobile accident. This was cured in two weeks, after another spinal treatment and two more local treatments. Irradiation seems helpful in severe, stubborn and recurring cases, and there is apparently some advantage in spinal irradiation. Mercuric salicylarsenate is apparently helpful, but acts more slowly. No form of treatment insured the patient against recurrence.

Six cases of otherwise uncontrollable cutaneous pruritus, of undetermined origin, cleared up after from two to eleven fractional treatments, the average number being 5.6. Patients with pruritus ani, vulvae or scrotalis were usually treated with roentgen rays in combination with cleansing and soda baths, douches and mildly antiseptic, antipruritic ointments. Treatment was also given for coexisting conditions, such as tinea or seborrhea. The results of treatment are given in table 8.

Pruritus ani occurred more commonly in males, in whom it had a greater tendency to recur than in females. Irradiation helped to relieve the patients in every case. The dosage used was one-half unit

TABLE 8.—*Results in the Treatment of Patients with Pruritus Ani, Vulvae and Scrotalis*

Diagnosis	Pruritus Ani			Pruritus Vulvae	Pruritus Scrotalis	Pruritus Ani and Vulvae	Pruritus Ani and Scrotalis	Total
	Males	Females	Total					
Number treated	36	8	44	30	17	2	11	104
Average treatments to cure in one course	5.6 (1 to 10)	5.7 (3 to 8)	5.65 (1 to 10)	5.57 (2 to 16)	3.8 (2 to 7)	3.0 (2 to 4)	6.0 (3 to 12)	4.8 (1 to 16)
Number requiring one course	27 (75.0%)	7 (87.5%)	34 (77.2%)	25 (83.4%)	15 (88.3%)	2 (100.0%)	9 (82.0%)	85 (81.7%)
Recurrences requiring second course	6 (16.6%)	0	6 (13.6%)	2 (6.6%)	2 (11.7%)	0	0	10 (9.6%)
Recurrences requiring third course	2 (5.5%)	0	2 (4.5%)	3 (10.0%)	0	0	1 (9.0%)	6 (5.7%)
Recurrences requiring fourth course	0	0	0	0	0	0	1 (9.0%)	1 (0.9%)
Recurrences requiring fifth course	0	1 (12.5%)	1 (2.2%)	0	0	0	0	1 (0.9%)
Recurrences requiring sixth course	1 (2.8%)	0	1 (2.2%)	0	0	0	0	1 (0.9%)
Total recurrences	9 (25.0%)	1 (12.5%)	10 (22.7%)	5 (16.6%)	2 (11.7%)	0	2 (18.0%)	19 (18.3%)
Failures	0	0	0	0	0	0	0	0

at the first treatment, one-third unit at the second and one-fourth unit at the third and each succeeding treatment; the interval was one week.

Two patients with prurigo nodularis, of six months' and sixteen years' duration, respectively, were benefited after long courses of fractional and semi-intensive irradiation, but neither could be completely cured.

In two of three cases of tuberculosis verrucosa cutis, and one of tuberculosis colliquativa, roentgen treatment in doses of from 1 to 1⅜ units was effective, eight or nine exposures being required. One patient with Boeck's sarcoid on the buttocks was cured with seven one-half unit doses, but two other patients with sarcoids on the face and shoulders could not be cured by irradiation. A case of erythema induratum also proved resistant.

Four patients with granuloma annulare received roentgen treatment in one-half unit doses. Three were cured with from five to seven treatments, and there have been no recurrences. In one patient the condition cleared up after ten one-half unit doses, but there was a recurrence in three months, and eleven more one-half unit doses, carefully spaced, together with solution of potassium arsenite, were required to complete the cure.

Irradiation was employed in twenty-two cases of verruca vulgaris, and six (27.2 per cent) known cures resulted, two following a single dose of 2 units, one treatment with 1½ units, two treatments with 1 unit, and one in four exposures in which doses of one-half unit had been used; there were no filters. Twenty patients with plantar warts were given a dosage of from 2 to 3 skin units, closely shielded. Nine were cured after one exposure, one after two treatments, and the rest failed to respond (50 per cent) and were cured by deep electrodesiccation. Juvenile warts are here today and gone tomorrow. Twenty-four patients received one-fourth unit or one-half unit doses of roentgen rays. Five of them were cured, possibly by the rays or perhaps by the power of suggestion. In some of the failures, mercury protiodide, sulpharsphenamine and various local applications were used without benefit. Irradiation was applied in one-fourth and one-half unit doses in four cases of filiform warts of the neck. Three failed to respond, and the fourth case cleared up after one-half unit dose, but recurred, and desiccation had to be performed. One case was observed in a woman in whom a second degree radiodermatitis of the face had been produced in an overzealous attempt to remove juvenile warts. The warts persisted, being more numerous than ever.

Forty-four patients with senile or seborrheic keratoses were cured by from one to four applications of moderately intensive irradiation (1¼ or 1½ units, unfiltered). In one case a keratosis on the ear did not respond to one treatment and was removed by electrodesiccation. Desiccation appears to be at least as satisfactory as irradiation, and one treatment usually suffices. Three or four fairly intensive (1½ unit) doses of roentgen rays were applied after the removal of all cutaneous horns with infiltrated bases, in order to destroy any beginning malignant process that might remain. Eight patients were treated after curettement or desiccation, with good results in seven. In the eighth case, presenting slight infiltration beneath a large horn on the lower lip, more intensive irradiation was given, but the condition responded only temporarily. Several arsenical keratoses disappeared after three exposures of 2 and 1½ units, but desiccation was a quicker and better method of removal. The same appeared to be true of leukoplakia of the lower lip.

In the treatment for basal cell epithelioma, the dosage was from 1½ to 2 skin units for the first exposure, followed by 1½ units, usually at intervals of four weeks. No filter was used. Treatments were given for epitheliomas of from several months' to twenty-two years' duration, whether small and superficial or large and fairly deep. The eyelids were involved in nine cases. Electrodesiccation was used as a supplementary procedure to replace the curet in some instances. The results are given in table 9.

One of the failures involved the inner canthus. Two were morpheaform epitheliomas, and the fourth occurred in an area to which radium had been applied a year previously. The four failures and four recurrences were cured by desiccation. As some of the cures are only of from one to three years' standing, all of them may not be permanent. Of the 125 patients, all were finally cured; 39 were last

TABLE 9.—*Results in the Treatment of Patients with Basal Cell Epithelioma*

	Two Treatments		Three Treatments		Four Treatments		Five Treatments		
	X-Ray Alone	Plus Desiccation	X-Ray Alone	Plus Desiccation	X-Ray Alone	Plus Desiccation	X-Ray Alone	Plus Desiccation	Total
1. Number cured	4	2	8	3	80	8	11	1	117 (93.6%)
2. Number recurring	0	0	0	0	2	0	1	1	4 (3.2%)
3. Number of failures	0	0	1	0	1	0	0	0	4 (3.2%)*
Total failures (2 and 3)	0	0	1	0	3	0	1	1	8 (6.4%)
Total number treated	...	...	...	...	...	...	...	...	125

* There were two failures after six treatments, making a total of four failures.

treated in 1925 or before that year, 19 in 1926, 12 in 1927, 24 in 1928, 20 in 1929 and 11 in 1930.

Twenty-three patients with prickle cell epitheliomas were treated, with four or five exposures of from 1½ to 1¾ units, the initial dose being from 1¾ to 2 units, usually unfiltered; the interval was four weeks. Only the patients with the earliest and most superficial conditions were treated, with four exceptions. The diagnosis was not checked by biopsy. In five of the cases, involving the lower lip, there have been no recurrences. One of the patients was treated in 1925, one in 1926, two in 1927 and one in 1928. In three others with involvement of the lip who were apparently cured in 1929 and 1930, the cures are too recent to be judged. Of the remaining fifteen, twelve are known to have had recurrences and three have not been accounted for. Irradiation failed in one case of Paget's disease.

Two irritated melanotic moles were removed by deep and wide desiccation together with intensive irradiation, and the patients have apparently remained cured since 1928 and 1929, respectively. Probably the moles had not yet become malignant. One was on the forehead

under the hat-band, and the other was on the outer aspect of the arm. Two others, which had become inflamed and crusted and were enlarging, did not end so favorably after similar treatment. My attitude is pessimistic regarding the treatment for melanomas.

Dermatitis herpetiformis responded favorably to irradiation. Eight patients were thus treated, and three were cured with one course (one cure being aided by sodium cacodylate, from 3 to 5 grains [0.195 to 0.324 Gm.] intramuscularly, twice a week). Two were relieved and discontinued treatment, and the remaining three had one recurrence which cleared up again readily. In two of the cases in which a recurrence took place, sodium cacodylate or solution of potassium arsenite had been used during the first course. The average number of roentgen treatments required for a course was 13.2.

Patients with persistently recurring herpes simplex and herpes progenitalis were treated with some apparent success, as table 10 indicates.

TABLE 10.—*Results in the Treatment for Herpes Simplex and Herpes Progenitalis*

Five Patients Treated	Duration	Location	Number of Treatments	Dosage	Comment
Two cured	2 years	Glans penis	5	¼ unit	Old gonorrhea treated
	6 years	Ala nasi	8	¼ unit	
Two relieved	6 years	Penis	4	¼ and ⅛ unit	
	4 years	Cheek	5	¼ unit	Outbreaks milder and much less frequent than formerly
			Recurred, then 2	½ unit	
One failure	4 years	Buttock	5	½ unit	

Of 208 patients with pityriasis rosea, 26 were treated fractionally with roentgen rays. These were the most severe and stubborn cases, and were usually pruritic. There was often a complicating seborrheic dermatitis. From one to four one-fourth unit doses were needed, and although the results seemed favorable, it would be difficult to prove that the eruption did not subside spontaneously. Mild ointments were also used throughout the course of treatment.

One case is particularly instructive: A man, aged 43, presented a medium coin-sized, sharply outlined, erythematosquamous patch on the abdomen, which was considered probably to be tinea corporis. This impression was not confirmed by the laboratory, but a mild ointment of thymol was ordered and one-fourth unit dose of roentgen rays administered. Within a week, a typical eruption of pityriasis rosea appeared, and three fractional treatments (one every week) were applied to the worst areas. The eruption faded in two weeks. The total course was nine weeks, from the first appearance of the herald

patch. It is said that an erythema dose of ultraviolet rays is effective in shortening the course of pityriasis rosea, but I have not tried to confirm this.

A patient with dermatitis dysmenorrheica on the cheek, of 2½ years' duration, had not had a recurrence after six one-half unit doses given in 1924. A case of lymphangiectodes in the axilla responded to four treatments of 1½ units each, and there had been no recurrence in five years. Ten one-eighth unit treatments, at weekly intervals, cleared up a case of lingua geographica, and fourteen one-eighth unit doses were sufficient in a case of cheilitis glandularis. A patient with granu-

TABLE 11.—*Summary of Results in Principal Conditions in Which Patients Were Treated by Means of Roentgen Rays*

Diagnosis	Number Completing Treatment	Number Cured with One Course	Number Recurring	Number of Failures
1. Acne vulgaris	399	335 (84.0%)	59 (14.7%)	5 (1.2%)
2. Rosacea	83	71 (85.5%)	4 (4.8%)	8 (9.6%)
3. Dermatophytosis	513	369 (71.9%)	104 (20.2%)	40 (7.7%)
4. Local neurodermatitis	71	56 (78.7%)	15 (21.2%)	0
5. Lichenification	148	124 (83.7%)	24 (16.3%)	0
6. Generalized neurodermatitis	11	0	7 (63.7%)	4 (36.3%)
7. Seborrheic dermatitis	328	258 (78.6%)	64 (19.4%)	6 (1.8%)
8. Psoriasis	237	109 (58.9%)	68 (36.7%)	8 (4.3%)
9. Lichen planus	44	39 (88.6%)	3 (6.9%)	2 (4.5%)
10. Pruritus cutaneus	6	6 (100.0%)	0	0
11. Pruritus ani, vulvae and scrotalis	104	85 (81.7%)	19 (18.3%)	0
12. Verruca vulgaris	22	6 (27.2%)	0	16 (72.8%)
Verruca juvenilis	24	5 (20.8%)	0	19 (79.2%)
Verruca filiformis	4	0	1 (25.0%)	3 (75.0%)
Verruca plantaris	20	10 (50.0%)	0	10 (50.0%)
13. Senile or seborrheic keratoses	45	44 (97.7%)	0	1 (2.3%)
14. Epithelioma, basal cell, x-rays alone	110	103 (93.6%)	3 (2.9%)	4 (3.8%)
Epithelioma, basal cell, x-rays plus desiccation	15	14 (93.3%)	1 (6.7%)	0
15. Epithelioma, prickle cell	23	5 (21.7%)	.....	18 (78.3%)
16. Dermatitis herpetiformis	8	3 to 5 (37.5 to 62.5%)	3 (37.5%)	0

losis rubra nasi was cured after four one-fourth unit exposures, and there have been no recurrences. Cheilitis exfoliativa and lichen spinulosis did not respond well. Two patients with granuloma fungoides and one with Hodgkin's disease with cutaneous nodules were helped temporarily; the latter patient discontinued treatment when improved, and could not be followed up.

Comment.—The great value of roentgen rays in dermatology is apparent in the foregoing summary. It is probably now the method of first choice, when employed intensively, for the destruction of basal cell epitheliomas, occasionally aided by electrodesiccation. It is a necessity in the treatment for keloid.

It also appears to be the best form of treatment, when used fractionally, in pruritic conditions, including localized neurodermatitis or lichenification, selected cases of stubborn pruritus cutaneus and pruritus

ani, vulvae or scrotalis, in combination with mild, antipruritic inunctions. Also in dermatitis herpetiformis and lichen planus it seems to be the most advantageous type of therapy. In severe and generalized lichen planus, semi-intensive spinal irradiation seems to hasten the cure, but simultaneous fractional treatment for the worst areas appears to be an added help.

In seborrheic dermatitis, acne vulgaris and rosacea, fractional irradiation seems to accomplish a quicker cure in a larger percentage of cases than any other method of treatment, but in order to facilitate the cure, suitable strict dietary regulations, together with proper remedies for the scalp and skin, must be used at the same time. The general health must also receive attention.

In the treatment for psoriasis, it is also probably the most effective single agent, but owing to the high percentage of recurrences it must be employed with extreme care, and possibly left for use as a method of last resort, while other forms of treatment are employed more as a routine. The same statement applies to the troublesome cases of generalized neurodermatitis, in which, fortunately, there is always a chance that the cause may be found and removed.

Patients with stubborn cases of eczematoid dermatophytosis usually seem to derive the greatest benefit from fractional irradiation. It should be used with care in selected cases, always with suitable mild antipruritic and parasiticidal applications.

In pityriasis rosea, fractional treatment seemed to shorten the course of the more severe cases, but this impression must be confirmed by further observations. In sycosis vulgaris, its use was abandoned for more effective local antiseptic measures.

In the treatment for all types of warts, irradiation appears to be greatly inferior to electrodesiccation. Plantar warts may be a possible exception, but the recorded percentage of cures is not encouraging.

Senile or seborrheic keratoses respond well to irradiation, but this method of treatment seems a little inferior to desiccation, which is quicker and produces satisfactory end-results.

For the destruction of prickle cell epitheliomas, intensive irradiation, as I employ it, seems suitable only in a certain number of the earliest and most superficial cases with involvement of the lip. In most cases, wide excision, radium implants, deep irradiation or combinations of these offer more hope of effecting a permanent cure.

The pitfalls in the use of roentgen rays seem to lie chiefly in placing too great reliance in this method of treatment alone, and in the continued irradiation of recurrences in the same area. In conditions which benefit by other forms of treatment, such as diets and various local applications, these aids should be employed to their full extent, to supplement the action of the rays and to help effect a cure with a

minimum amount of irradiation. Furthermore, it appears that most of the recurrences of the pruritides, acne vulgaris, rosacea, seborrheic dermatitis and dermatophytosis might be prevented by the routine instruction of every patient regarding preventive care after the course of treatment has been completed, and by impressing the patient with its importance. The pruritides may often be warded off by continued proper bathing, followed, if necessary, by bland, protective inunctions and the immediate use of antipruritic ointments when required. Many recurrences of dermatophytosis could, no doubt, be prevented by the continued use of mild local parasiticidal applications, at least every night, in order to destroy any persisting infection and prevent reinfection; however, overtreatment with irritating applications is to be avoided. It seems likely that many recurrences of acne vulgaris, rosacea and seborrheic dermatitis could be avoided easily by insisting on continued adherence to a suitable diet and uninterrupted care of the scalp. A complete physical examination is always desirable. Recurrences of neurodermatitis, local or general, and lichenification may often be prevented by the removal of possible causative factors, and by the instruction of the patient in the immediate use of suitable antipruritic ointments at the first sign of returning pruritus. Since one cannot prevent recurrences of lichen planus and psoriasis, and also certain recurrences of neurodermatitis and other conditions, one must use one's therapeutic versatility in dealing with them, and avoid excesses of irradiation. The roentgen rays probably constitute the most valuable curative agent in dermatology, but they must not be used to excess, and one must not expect too much of them.

TREATMENT BY MEANS OF ELECTRODESICCATION

Eleven patients with granuloma pyogenicum were treated, and all were cured by one application of the needle. There have been no recurrences.

Warts of all types were removed successfully by desiccation, including 153 on the hands and fingers and 184 on the face, neck and scalp. In dealing with verrucae barbae, two or more crops of new lesions had to be removed in 40 per cent of the cases. In sixteen cases plantar warts were desiccated (four of these also presenting verrucae vulgares on the hands). Two, on the soles, had resisted 2, 2⅛ and 2¼ skin units of unfiltered roentgen rays. Desiccation had to be repeated once in one case. Deep destruction is necessary to prevent recurrence, and after the operation the pain is usually relieved rather than aggravated.

Eight patients with molluscum contagiosum were treated by desiccation. Lesions were found on the upper eyelids, face, neck, arms and trunk, and they were sometimes numerous. One treatment sufficed, and there was no recurrence.

Pale fibrous nevi were removed satisfactorily in ninety-two cases, raised pigmented nevi in fifty-one, flat pigmented nevi in six, hairy nevi in four and pigmented hairy nevi in seven. The eyelids were involved twice, the face one hundred and twenty-five times, the neck thirty-seven, the axillae ten, the trunk thirteen, the arm seven, the groin once, the scalp twice and the hand once. In eight instances a second application was necessary. The results were entirely satisfactory to the patients.

Five patients with verrucose nevi were treated. Two of the nevi, which were of medium and large coin size, were destroyed with apparently good results, but in the remaining three, located on the cheek and above and behind the ear, a troublesome and persistent tendency to regrowth was noted. Therefore, in this type of nevus the results were only about 40 per cent satisfactory. Unfortunately, the effects of intensive roentgen irradiation were not tested in this type of recurrence, but they might prove valuable.

In thirty cases a nevus araneus was removed from the face. Eight nevi were removed from children, aged from 5 to 13 years, and twenty-two from patients from 15 to 58 years of age. Some of the nevi may have been of traumatic origin. All responded well, and few required a second treatment. The central blood vessel was destroyed.

So-called senile angioma of the lower lip was removed in one treatment in seven cases, without recurrence. In one of these cases radium had been ineffective. In fourteen patients with disfiguring senile telangiectases on the face, the largest vessels were destroyed, to the satisfaction of the patients. In five cases of chronic radiodermatitis, the more prominent telangiectases were removed, with considerable resultant cosmetic improvement.

Three small and medium coin-sized cavernous angiomas were removed: one from the tip of the nose, one from the nostril and one from the leg. The results were excellent, and the scarring was not objectionable. This method of treatment seems advisable, at least when response to radium is not prompt.

The senile and seborrheic keratoses were not differentiated. Desiccation was used in 123 cases, the eyelids, ears, all parts of the face, scalp, trunk, arms and hands being involved. The results were uniformly good after a single treatment, which was much more rapidly effective than roentgen irradiation and at least as satisfactory to the patients. In five cases cutaneous horns were removed. All were located on the cheek, and in two with infiltrated bases three intensive roentgen exposures (1½ skin units) were given after the keratosis had been removed. No recurrence was observed.

Only two patients with leukoplakia received this treatment. One case was extensive. Both of the patients did well.

Two men presented large numbers of arsenical keratoses, and there were several painful ones about the heels. These lesions, and also several on the hands, were removed. The good results have been lasting.

Desiccation was used in thirty-three cases of basal cell epithelioma, usually together with roentgen rays, and ordinarily at the second or third irradiation, as a means of hastening beneficial results. In nine cases it was used in the same manner as a curet, on elevated, verrucous or nodular tumors before irradiation was begun. Eight of the patients were cured, and the ninth stopped treatment after two irradiations, improved. In some cases, of course, treatment was given for several epitheliomas; seven about the ear or scalp were desiccated without irradiation. All of the patients were cured, but some had been treated too recently for the permanency of the results to be judged. In seven cases, in which recurrence had followed roentgen treatments, and in another in which there had been a recurrence after the application of radium, desiccation was successful.

Only two patients with prickle cell epitheliomas were treated with the needle, together with roentgen rays. One tumor, which was extensive on the inside of the cheek, was electrocoagulated and intensively cross-fired by roentgen and radium irradiation, but failed to respond. The other, which was slightly infiltrated, on the lower lip, was desiccated once and received four intensive irradiations. The patient has remained cured since 1928.

Twenty-two sebaceous cysts, of small and medium size, were desiccated, and one treatment was successful in all cases. Two had been incised previously, and had been treated with caustic applications. Five pea-sized mucous cysts of the labial and buccal mucosa were removed in one application.

Other conditions in which a single application was effective include: one hydrocystoma, with many small tumors, great improvement after two sittings; one multiple benign cystic epithelioma; three cases of xanthelasma; one painful nodule of the ear; one case of probable nonpainful nodule of the ear (Klauder); two synovial lesions of the skin; two cases of periadenitis chronica mucosae recurrens; one case of lupus vulgaris with small scattered nodules, and one case of lupus vulgaris of widespread superficial type, with central scarring and an active, ulcerative margin. In the last case, the patient was treated with apparent success in 1922 and has not been observed for several years, so that the condition may have recurred. In one case, several lesions of Boeck's sarcoid were removed by desiccation, and have not recurred. A patch of lupus erythematosus on the lip and one on the cheek, in the same patient, disappeared after desiccation, but in two other cases small, isolated discoid lesions were given from two to three treatments and recurred.

Desiccation aided in the removal of the two melanotic moles, as described under the heading of roentgen treatment. In a case of endothelioma, developing in a brown nevus on the abdomen, deep, wide electrocoagulation plus intensive roentgen exposures proved ineffective, and metastases ensued.

In two stubborn cases of psoriasis, a few of the lesions were desiccated, without benefit.

Keloid followed desiccation in two cases. The first was the case of widespread superficial lupus vulgaris, occurring in a Negro, previously described. In this case, keloid formation was evident within a month after the treatment, and it disappeared after four 1 unit doses of roentgen rays, at intervals of a month. Four irradiations were also required in the case of a girl from whose chin a small fibrous mole had been removed a month previously. It is better to explain this possibility to the patient before using desiccation. The results after irradiation are good, as in the case of most keloids. Aside from these two cases, there was no objectionable scarring, and the patients were well pleased with the results.

Summary and Comment.—Desiccation appears to be the method of choice for the removal of all types of warts, including plantar warts. In the latter, irradiation may be tried first, if preferred, but one desiccation, if sufficiently deep, usually removes the wart, and is followed by very little discomfort. Warts may be removed from the face and neck with excellent cosmetic results. The same statement applies to fibrous nevi, but verrucose nevi may recur.

There seems to be no better way of removing nevi araneus, telangiectases and senile angiomas; cavernous angiomas may also be removed by this means, more quickly and perhaps better than with radium. Of course, this statement does not apply to the cases that respond to radium at once, which fade without pronounced atrophy.

Senile and seborrheic keratoses, cutaneous horns and arsenical keratoses can usually be completely removed by one desiccation, but if there is any suggestion of beginning malignancy, this treatment should be supplemented by roentgen irradiation.

Sebaceous and mucous cysts are rapidly and effectively removed by this method.

It is a quick and effective means of removing xanthelasma and granuloma pyogenicum.

It may also be employed for the removal of basal cell epitheliomas, but in such cases it should be combined with roentgen irradiation, in order to insure the destruction of any outlying cancer cells. This applies also to the treatment for prickle cell epitheliomas.

Desiccation has been a valuable addition to the armamentarium, probably standing second to the roentgen rays.

TREATMENT BY MEANS OF ELECTROLYSIS

The value of electroylsis for the removal of hair was demonstrated in thirty-nine cases of hypertrichosis and seventeen hairy nevi. Eleven of the nevi were also fibrous or verrucose; trichloracetic acid was applied to three and desiccation to eight.

Desiccation was found to be quicker and better than electrolysis for the removal of fibrous nevi, six of which were treated by electrolysis, one twice. Two patients with nevi araneus were treated; in one a recurrence took place. Desiccation seemed perferable in this condition, as well as in the treatment for facial telangiectases, filiform warts and verrucae vulgares. Three patients with facial telangiectases, four with common warts and five with filiform warts were treated by electrolysis, but this method was discarded because there was a tendency for the electrolytic needle to leave linear scars, and second treatments were often needed.

Conclusion.—Electrolysis is recommended as the best procedure for the permanent removal of hair, but in the other conditions mentioned it seems to be second to desiccation.

TREATMENT BY MEANS OF RADIUM

Fifteen patients with cavernous hemangiomas were treated with a half-strength flat radium plaque, containing 10 mg. of radium. Thirteen of the patients were infants, and two adults. All of the lesions were superficial, and semi-intensive treatment was given, at intervals of about two weeks, with thin aluminum filters and a rubber dam, applied directly to the skin. An average of ten treatments was needed, although in two patients the tumors disappeared after the first exposure. More or less atrophy and telangiectasia followed in most of the cases, and therefore I prefer the quicker method of electrodesiccation, which usually leaves an acceptable scar and no undesired sequelae. Radium failed in one of the adults, and desiccation was then used effectively. Possibly better and quicker results might have been obtained by a different technic, but atrophy would probably not have been avoided.

Three patients with senile angiomas of the lower lip were treated with radium, semi-intensively. In one case, four exposures were effective, but in the other two desiccation had to be used because radium failed.

Likewise, desiccation was found to be preferable in the treatment for leukoplakia. This does not include cases in which there is beginning formation of epitheliomas.

The value of radium in the treatment for prickle cell epithelioma is recognized, but my small flat applicator was not considered suitable for that purpose. Patients with such cases, presenting any considerable

infiltration, even with no involvement of the palpable lymph nodes, were sent to a radiologist, who has treated a number of them effectively.

On account of the greater accuracy of dosage measurement and the greater speed and convenience of application, roentgen rays have always been preferred in the treatment for accessible epitheliomas.

Summary and Conclusion.—A 10 mg. half-strength flat applicator of radium was found useful in the treatment for cavernous angiomas, especially in infants. In many cases desiccation is at least of equal value.

TREATMENT BY MEANS OF ULTRAVIOLET RAYS (KROMAYER LAMP)

Twenty-nine patients with alopecia areata and one with a recurrent case after two years were treated. Four discontinued treatment, unimproved, after the first or second application. Exposures were usually given from every ten to fourteen days, with the lamp at a distance of 6 or 8 inches (15.24 or 20.32 cm.) from the scalp, an erythema dose being administered, producing some vesiculation at times. Only patients with stubborn cases were treated in this manner, always in conjunction with the use of stimulating lotions, frequent shampooing and massage twice daily. When the erythema was severe, of course, these measures were temporarily suspended.

Two patients were not benefited by three and seven applications. Two cases of ten and twelve years' duration required twenty-seven months for complete regrowth, during which time the ultraviolet applications were alternated with applications of phenol and alcohol. One of nine years' duration showed improvement after two weeks, and one of eighteen years' duration improved in a month. In a case of six years' duration, four and one-half months of treatment were ineffective. Cases of shorter duration showed regrowth, on the average, after ten weeks of treatment, and it seems possible that the added irritation furnished by the sunburn accelerated regrowth somewhat.

Fifteen patients with premature or seborrheic alopecia were similarly treated. Five discontinued treatment in a week or two. Four were not benefited by several weeks' treatment, four were slightly improved, and four were considered as improved after from two to fourteen months. ("Improvement" means the checking of the loss of hair. I have never observed an increased growth of normal hair in this type of case. The growth of lanugo hair has sometimes appeared to be stimulated.)

Five patients with nevus flammeus were treated by exposure to the lamp under pressure with a quartz applicator in doses sufficient to produce vesiculation. Three showed some improvement following several such exposures, and the other two, whose lesions were extensive, derived great benefit from two or three years of intermittent treatment. The improvement has been lasting. Although the affected areas faded greatly

under treatment, the last traces of the condition have never completely disappeared. The same may be said for this treatment in radiodermatitis. One patient was treated nine times without benefit.

One case of tuberculosis verrucosa cutis, which had resisted 9 units of roentgen rays, cleared up after nine treatments with the Kromayer lamp. Two patients with lupus vulgaris were not improved after many intensive treatments under pressure, and one patient with perianal tuberculosis cutis failed to improve after thirty-two exposures, even with the aid of constitutional treatment.

Before the introduction of better treatment, six patients with discoid lupus erythematosus were treated by the lamp under pressure. Three were apparently cured, but in one a recurrence had appeared within a year; the recurrence disappeared after four weeks of treatment with the Kromayer lamp. A fourth patient showed improvement, and in the remaining two, treatment was without effect.

Ultraviolet light was of some apparent benefit in an old case of erythema induratum, and in a stubborn case of ecthyma. Small ulcers in areas of chronic radiodermatitis were healed in from two to six months. A palm-sized ulcer, which had developed in a patch of scleroderma, failed to clear up under treatment, even with the use of desiccation.

Since no air-cooled lamp was used, it cannot be considered in this report, although its value in the treatment for psoriasis, pityriasis rosea, etc., is conceded.

Summary and Comment.—The Kromayer lamp, probably acting as a source of irritation, was apparently beneficial in some cases of alopecia areata, and in the treatment for sluggish ulcers. As a rule, one may easily dispense with its use. It may occasionally be of value in cases of lupus erythematosus that resist more modern therapy. Considerable improvement, but probably no complete cures, may be produced by its prolonged use, under pressure, in cases of nevus flammeus.

GENERAL SUMMARY AND CONCLUSIONS

A series of 7,206 cases, constituting my private dermatologic practice for more than nine years, is analyzed with regard to the effectiveness of treatment with roentgen rays, radium, ultraviolet rays, electrolysis and electrodesiccation. In this series, 3,541 patients received at least one of these forms of therapy.

In each condition of the skin treated by one of the foregoing methods, the number and percentage of cures, recurrences and failures are recorded.

While the roentgen rays are probably the most valuable single therapeutic agent in dermatology, too much reliance must not be placed

on their use alone, and they must not be used excessively. It is recommended that their effectiveness be reinforced by the simultaneous employment of any other measures that may be of value, provided they are not too irritating. Recurrences of many conditions of the skin may often be prevented if the patient follows certain precautions in the care of the skin or scalp, and often in the diet. Such prevention is better than too many roentgen treatments. Unpreventable recurrences must be handled cautiously, and other applications should be substituted for the roentgen rays when possible.

Electrodesiccation is considered another valuable method of treatment, and the one that seems most suitable for the removal of warts, moles, keratoses, leukoplakia, telangiectases, molluscum contagiosum, granuloma pyogenicum, xanthelasma and a number of other conditions, and at least a valuable aid to irradiation in the treatment for epitheliomas.

Electrolysis was found to be the best procedure for the permanent removal of hair. For other purposes desiccation was preferred.

Radium is judged only partially, with regard to the effectiveness of a 10 mg. half-strength flat applicator, which was not employed extensively. It was found useful for removing cavernous angiomas, but in many such cases electrodesiccation was considered possibly the method of choice.

Ultraviolet rays, as produced by a water-cooled mercury arc lamp, were found to be of uncertain value as a local irritant in cases of alopecia areata and apparently helpful in the healing of certain sluggish ulcers. They were somewhat beneficial when applied under pressure to nevus flammeus, but were never completely effective, even after long periods of treatment. The air-cooled lamp was not used, and its possible value is therefore not considered.

ABSTRACT OF DISCUSSION

Dr. Howard Fox, New York: The speaker did well to obtain clinical cures in acne with an average of thirteen weekly treatments. In rosacea 85 per cent of good results is very high from any combination of methods. I think that a large proportion of such results were mainly due to the other methods employed, such as diet, hygiene, etc. Rosacea certainly does not respond to the roentgen rays nearly as well as does acne. As to sycosis, the author does not seem favorable to roentgen rays, though he speaks of its value in 40 per cent of the cases, a high proportion in my opinion. I would like to know how he can cure twelve of fifteen patients by any known method. Tinea capitis in New York does not respond satisfactorily to any agent except the roentgen rays. Why patients can be successfully treated by salves in the Middle West and not in the East I have never understood. The speaker's results in seborrheic eczema were unusually favorable, even considering the 19.4 per cent of recurrences. In psoriasis I use the roentgen rays for lesions of the scalp as a routine measure, followed by local applications. I agree entirely with Dr. Parkhurst's remarks about the necessity of extreme caution in treating patients with psoriasis, on

account of frequent recurrences and the danger of cumulative dosage. I also agree with his remarks about the curative value in lichen planus and palliative aid in pruritus ani et vulvae. My experience with both common and plantar warts would parallel the speaker's, though possibly a little more than 50 per cent might be permanently cured, especially by repeating the treatment once or twice. In the treatment for basal cell epithelioma following removal by endothermy or curet, I personally give a dose of 3 skin units of unfiltered rays as opposed to the 1½ or 2 units of the speaker. In only one case have I noticed any resulting telangiectasia, and that was rather insignificant. I was interested to hear of roentgen treatment for lingua geographica, as I believe I was the first to use this method, Dr. Ormsby being the first to use radium in this disease.

I agree in general with Dr. Parkhurst's remarks about the use of electrodesiccation. I think, however, that better cosmetic results can be obtained in extensive pigmented and hairy moles by carbon dioxide snow, while in small elevated nonhairy moles I think that the electric cautery is without a rival. As to ultraviolet therapy, I also think that one can easily dispense with the Kromayer lamp, but not the air-cooled type. This agent, I think, is of distinct value in a number of dermatoses, though its action must be considered, as Erwin Zeisler said, mainly as an adjuvant to other therapeutic methods. As to radium, I think that its place is extremely limited for the dermatologist, and with a very few exceptions it should be used only by those whose entire time is devoted to this method of treatment.

Dr. William A. Pusey, Chicago: Nearly every time I hear a description of what can be done by electrodesiccation I think of how easily we can do the same with the electric cautery. A desiccation apparatus is rather expensive and cumbersome, but an electric cautery is cheap and easy to use, and I recommend, with a good deal of feeling of interest in you, that you cultivate more the electrocautery. I entirely disagree with the remark of Dr. Fox, that radium should not be used by the dermatologists but left to those who specialize in its use. I do not know of anything that is better in the treatment for small areas than a radium plaque. For example, I have a small keratosis on my hand, and if we met three weeks from now I would show you the excellent result secured by radium, and no bad effects. I think that there is no difference in the biologic effects between radium and the roentgen rays. I cannot see why you should have 300 or 400 mg. of radium and screen out most of it, and leave the work to those who known radium and not skin diseases. Radium for me is a remedy to be used after expert diagnosis. A small piece of radium that a man can apply to clear up these conditions is excellent. There is no reason why a dermatologist with thirty minutes of training should not know how to use a small radium plaque.

Dr. Samuel Ayres, Jr., Los Angeles: In regard to keloid formation following the treatment for moles, I think that this can be largely obviated and a better result obtained by using the fractional desiccation, just lightly brushing the spark over the mole, and repeating it in two or three weeks. Within a short time the mole melts away, and I have never seen a cosmetic result that I have been ashamed of.

In the treatment for keloid, I have always thought that the fractional dose is just as effective as the large dose, without the danger of telangiectasia. I favor the use of deep coagulation or an endotherm knife rather than desiccation for the melanotic moles.

In regard to plantar warts, I think that we can obtain 100 per cent good results by preliminary peeling down with strong salicylated collodion. Following this the use of a half strength plaque of radium, unfiltered, for one hour gives admirable

results with no disability to the patient. This may have to be repeated several times, but I have yet to see a case that could not be relieved in this way. I fully agree with Dr. Pusey in regard to the use of radium by the dermatologist.

In the matter of ultraviolet rays, there is a new modification of the air-cooled light that has recently been put on the market in the West, which I think will be time saving. It is called "cold quartz." It does not heat up and can be brought to within 1 or 2 inches (2.5 or 5 cm.) of the skin. It is possible to treat a whole body area with a good erythema dose in one and one-half minutes, which is time saving.

In regard to tinea capitis, I think that in the West the majority of physicians do not use roentgen therapy. I do not know whether it is because Microsporon lanosum is our predominant organism, but I think that with careful asepsis of combs, brushes and hats practically all cases can be relieved in from six to eight weeks without roentgen therapy, by the use of forceps epilation, iodine, 10 per cent ammoniated mercury ointment, Whitfield's ointment, etc.

Dr. Bedford Shelmire, Dallas, Texas: I would like to add tattoo marks to the list of conditions that may be successfully treated with electrodesiccation. After trying many methods for the removal of these pigmentations, desiccation has been found quicker, more convenient and accompanied by better cosmetic results in all except the smaller lesions, which can be excised surgically.

The area of the tattoo, under local anesthesia, is lightly desiccated. The skin overlying the tattoo pigment is then easily removed with a hollow curet, exposing the bright pigments of the mark. Much of this pigment can then be removed by the curet. The area is repeatedly very lightly desiccated and curetted until all the pigment is removed. The resultant scars after healing of such lesions approximate those obtained after removal of tattoo marks by other methods. I have observed no special tendency toward keloid formation.

Dr. Fred Wise, New York: I think that Dr. Parkhurst is to be congratulated not only on the work he described in his paper, but on the excellent results he has obtained with relatively small amounts of radiation therapy.

I must say that my results in the treatment for acne, and especially rosacea, have never been anything to brag about, either in my own opinion or in that of the patients. I have never been able to cure patients with severe cases of acne with the small amounts of roentgen therapy Dr. Parkhurst has mentioned, and when it comes to rosacea I still do not know whether radiation is good treatment or bad. I have many cases in which roentgen therapy seems to help, but a great many of the patients must be treated constitutionally, over prolonged periods, as everyone knows.

In other diseases, for example mycosis fungoides, which we could not even palliate before the discovery of the roentgen rays, there are cases that respond like magic to this treatment, and there are others that do not respond at all. We found that the histologic changes in the lesions of the ones that respond favorably differ from those in the ones that do not respond well to roentgen therapy. In one case the infiltration in the corium consisted of plasma cells almost exclusively, and although the eruption was mycosis fungoides clinically, roentgen therapy not only had not helped the patient but had made the eruption worse. That is a disappointment in connection with roentgen therapy in the treatment for a disease in which we have depended on it to bring about remissions or even cures. The same applies to certain cases of Kaposi's sarcoma. We have learned that patients with eruptions of Kaposi's sarcoma who are treated with filtered roentgen therapy usually are benefited. We have a patient under treatment for whom long-continued, superficial roentgen therapy was of no avail. The disease continued to

progress, and we then instituted deep roentgen therapy with 3 mm. of aluminum, but the results have been poor and the condition has progressed despite all our efforts.

With regard to other diseases, it must be left to one's judgment whether to employ carbon dioxide snow, desiccation or other surgical measures. The possible cosmetic results, such as scarring and the production of keloids, must always be borne in mind.

In the treatment for common warts with the roentgen rays, my results have been unsatisfactory on the whole, and I have resorted to carbon dioxide snow, desiccation, curettage and so forth.

With regard to xanthelasma, I believe that subjecting the eyelid to injections of procaine hydrochloride, ablation and stitching is not a good practice. I think that the best treatment consists of applications of trichloracetic acid, 50 per cent solution, with long intervals between treatments. This produces no ectropion or visible scarring, and the end-results are better than can be accomplished by any other treatment I know of.

DR. WILLIAM A. PUSEY, Chicago: I should like to say one thing about the treatment for xanthoma of the eyelid. It seems to me that it is impossible to find a better treatment than punctate cauterization. If superficial punctate cauterization is done almost as close as dots can be made with a pin point, a clean scar and a perfect result will be obtained, except for a lack of pigment in the area.

Concerning the point of keloids resulting from desiccation with the cautery and trichloracetic acid, I do not know whether it is the general practice, but why should we not apply radium plaques to these scars early? In my experience, they can be melted down by a moderate dose of radium.

DR. CHARLES M. WILLIAMS, New York: In the treatment for xanthoma, desiccation has given me the best results. With a fine needle one can lift up the skin of the eyelid so as not to go deep, and then one can make the treatment as superficial as one likes. Within a week or two one would hardly know there was any scarring, and the disease is gone. I have known them to recur, but the cosmetic result is good. I have never used procaine hydrochloride on the eyelid.

DR. CHARLES C. DENNIE, Kansas City, Mo.: I think that xanthoma will recur no matter what treatment is used, and the most simple treatment I know of is equal parts of trichloracetic acid, 95 per cent carbolic acid and alcohol. The lesions are painted with this mixture; they will turn white and peel off, and the xanthoma is gone.

DR. WILLIAM H. GUY, Pittsburgh: I think that in xanthelasma careful surgical excision as an office procedure is the method of choice. It has been my practice to excise these lesions, and I see no objection to using procaine hydrochloride. With a fine knife make an incision parallel to the lines of cleavage, carefully dissect out the lesion, and after the bleeding has stopped and every evidence of the lesion has been removed, bring the edges together with horse hair. I have never failed to secure primary union. Only seven days with a small dressing is required. A month later it is difficult to make out the line of incision.

DR. HOWARD J. PARKHURST, Toledo: I appreciate this generous discussion. Replying to the point Dr. Fox and Dr. Wise brought up regarding the almost too good results obtained in the treatment for acne and rosacea, those results were, as they guessed, due to strong insistence on proper dietary and hygienic measures, and constitutional treatment when indicated.

Regarding the efficacy of irradiation in sycosis, my results were not even 40 per cent good, as I stated in the paper, and I thought that I could obtain better results by the use of suitable ointments locally.

Regarding the irradiation of tinea capitis, as Dr. Ayres stated, and as is well known in our part of the country, irradiation is seldom if ever required and I have never had to fall back on it.

The dosage I used in the treatment for epitheliomas was rather small, but I found it successful in a very large percentage of basal cell epitheliomas, with slight atrophy ensuing.

I was interested in Dr. Wise's statement regarding the histologic picture of mycosis fungoides. I have had experience in only two or three cases of that disorder, which apparently responded well.

Regarding the use of the cautery in the treatment for warts and moles, as suggested by Dr. Pusey and Dr. Fox, I agree with them, but I have made a habit of using electrodesiccation and find it successful in my hands.

In xanthoma, the lesions can be removed with slight amount of pain by desiccation, without an anesthetic. The same is true of other lesions on the eyelids.

As to my neglect of radium, I have been in the habit of using the roentgen rays, but I know radium is quite as valuable if one cares to use it. In treating keloids, I think that this measure is equivalent to roentgen therapy if one prefers it.

In regard to keloid following treatment, possibly the same results can be obtained by fractional electrodesiccation, but I wish to call your attention to the fact that keloid occurred only twice in eight hundred and two cases.

I am interested in what Dr. Shelmire said about the use of light desiccation in the treatment for tattoo marks. I have not used it for that, but I have used it successfully in two cases of accidental tattooing following injury.

Regarding the value of trichloracetic acid and similar preparations in the removal of xanthelasma, I am in complete agreement with the discussers, but I thought that electrodesiccation was more efficacious and the results more rapid

KLINE FINGER BLOOD PRECIPITATION TEST FOR SYPHILIS

A COMPARATIVE STUDY WITH WASSERMANN AND KAHN METHODS, WITH CLINICAL EVALUATION IN MORE THAN FIVE HUNDRED CASES *

JOSEPH JORDAN ELLER, M.D.
AND
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The purpose of this paper is to present a comparative study of the Kline finger blood test for syphilis [1] and the accepted complement-fixation and precipitation tests, with special emphasis on the agreement of the tests with clinical findings. Since the finger blood test takes only a few minutes to do and requires only a small quantity of comparatively easily obtainable finger blood, this test is particularly useful in testing blood of infants and obese patients with small veins and in checking the blood of professional donors immediately before transfusions.

The specimens of blood were obtained from hospital and private practice. The patients were divided into syphilitic and nonsyphilitic groups; the latter included all patients with miscellaneous dermatoses and patients who presented themselves for syphilitic investigation who proved to be normal both clinically and serologically.

The finger blood test was performed according to the following technic described by Kline.

TECHNIC

1. Place a finger blood test slide with two small chambers and two finger blood test slides, each with a large chamber, on a tray. On the second tray place three similar slides and place the two trays in a large holder.

2. Pipet into each of the four large chambers on four slides 0.05 cc. of a 3 per cent sodium chloride solution (p_H about 6) close to the paraffin wall.

3. Draw up 0.17 cc. of defibrinated finger blood and pipet 0.04 cc. into a small chamber and 0.1 cc. into a large chamber, using the tip of the pipet to move

* Submitted for publication, May 12, 1931.

* From the Department of Dermatology and Syphilology and the Post-Graduate Medical School and Hospital, Columbia University.

1. Kline, B. S.: Microscopic Slide Precipitation Tests for the Diagnosis and Exclusion of Syphilis, J. Lab. & Clin. Med. **16**:186 (Nov.) 1930; Microscopic Slide Precipitation Tests for the Diagnosis and Exclusion of Syphilis, Brit. J. Ven. Dis. **7**:32 (Jan.) 1931.

the fluid into the limits of the inner chamber. Repeat the procedure with blood from additional cases.

4. After the specimens of blood are pipetted, allow a small drop (about 0.01 cc.) of a 3 per cent solution of sodium chloride (p_H about 6) to fall from a Wright pipet into the blood in each small chamber.

5. Rotate the slides in the holder on a flat surface with moderate vigor for one minute.

6. Into the large chambers, allow one small drop (about 0.008 cc.) of exclusion test antigen emulsion to fall from a Wright pipet. Into each of the small chambers allow a drop of similar size of the diagnostic test antigen emulsion to fall from a Wright pipet.

7. Rotate the slides in the holder on a flat surface for four minutes.

8. Into the large chambers allow 5 cc. and into the small chambers, 2 cc. of distilled water to fall from a 25 cc. pipet (graduated in 0.1 cc. or 1 cc.).

9. Agitate the fluids by moving the holder very gently (avoid spilling) for one minute.

10. Examine the results at once or at any time within fifteen minutes through the microscope at a magnification of about 120 times in the same way as in the other tests.

The Kahn and Wassermann tests were performed by Dr. Eugene Trouveller at the New York Post-Graduate Hospital laboratories. The method used in the former was similar to that outlined in Kahn's manual.[2]

The Wassermann tests were done with two antigens, one an alcoholic extract of beef heart and the other, a similar antigen reinforced with 0.2 per cent of cholesterol. The materials tested with both antigens were kept in the icebox over night for the period of fixation.

The slide tests on the heated serum from the arm and finger blood were performed according to the technic described by Kline[3] and Young[1] with the Kline antigen.[4]

RESULTS

For this comparative study, 545 specimens of blood were obtained from the finger and defibrinated for the finger blood test. At the same time, a larger quantity of blood from the arm was obtained to furnish serum for the Wassermann, Kahn and microscopic slide precipitation tests. Furthermore, in 280 cases sufficient defibrinated finger blood was obtained for additional heated serum slide tests. Fifty-nine per cent of the blood specimens were obtained from patients with proved cases of syphilis.

The evaluation of the results of this comparative study was made according to the method of Kahn as follows: positive reaction, 4 plus,

2. Kahn, R. L.: Serum Diagnosis of Syphilis by Precipitation, Baltimore, Williams & Wilkins Company, 1925.

3. Kline, B. S., and Young, A. M.: A Microscopic Slide Precipitation Test for Syphilis (Second Communication), J. Lab. & Clin. Med. **12**:477 (Feb.) 1927.

4. Kline, B. S.: An Antigen for Use in Serum Tests for Syphilis, J. Lab. & Clin. Med. **13**:588 (March) 1928.

3 plus and 2 plus; doubtful reaction, 1 plus and ±; agreement, positive or negative by both methods; relative agreement, positive or negative by one method and doubtful with the other; disagreement, positive by one method and negative with the other.

COMPARISON OF 545 DIAGNOSTIC FINGER BLOOD TESTS AND WASSERMANN REACTIONS (NONCHOLESTEROLIZED ANTIGEN)

In 222 nonsyphilitic cases there were no disagreements between the results obtained by the diagnostic finger blood test and those obtained with the Wassermann test with the noncholesterolized antigen, so that the total agreement was 100 per cent. In the 323 syphilitic cases, there were 90 disagreements with a resulting total agreement of only 72.13 per cent. Of the 90 disagreements there were 85 specimens that were positive with the diagnostic finger blood test and negative with the noncholesterolized Wassermann test, while only 5 specimens were negative with the diagnostic finger blood test and positive with the Wassermann test. Thus, if the diagnostic finger blood test alone had been done, only 5 cases of syphilis would have been missed, while if the noncholesterolized Wassermann test alone had been done, 85 cases of syphilis would have been missed. This comparative study shows the greater sensitiveness of the diagnostic finger blood test over the noncholesterolized Wassermann reaction and also demonstrates the importance of doing both a precipitation test and a complement-fixation reaction in order to report the most accurate results to the clinician. The total agreement of the combined syphilitic and nonsyphilitic cases in this comparative study was 83.48 per cent.

COMPARISON OF 545 DIAGNOSTIC FINGER BLOOD TESTS AND WASSERMANN REACTIONS (CHOLESTEROLIZED ANTIGEN 0.2 PER CENT)

There was a similar agreement of 100 per cent in the nonsyphilitic cases. The more sensitive Wassermann reaction (with the cholesterolized antigen) gave a larger number of positive reactions in the syphilitic cases, resulting in a closer agreement (79.50 per cent) in that group. Of 66 disagreements, 61 cases were positive with the diagnostic finger blood test and negative with the cholesterolized Wassermann test, while the other 5 were negative with the diagnostic finger blood test and positive with the Wassermann test. This demonstrates the greater sensitivity of the diagnostic finger blood test over the cholesterolized Wassermann reaction. The total agreement of the combined syphilitic and nonsyphilitic cases in this comparative study was 87.88 per cent (4.40 per cent higher than with the noncholesterolized Wassermann reaction).

COMPARISON OF 535 DIAGNOSTIC FINGER BLOOD TESTS AND KAHN TESTS

There was a greater agreement (87.33) of the diagnostic finger blood test with the Kahn than with the Wassermann reaction. There were 40 disagreements in the syphilitic group; 37 cases were positive with the finger blood test and negative with the Kahn test and 3 were negative with the finger blood test and positive with the Kahn, which demonstrates the increase in sensitiveness of the former over the latter precipitation test. The total agreement of the combined syphilitic and nonsyphilitic cases was 92.52 per cent.

COMPARISON OF 552 DIAGNOSTIC FINGER BLOOD TESTS AND DIAGNOSTIC HEATED SERUM TESTS

In this group there was only one disagreement, with a resulting total agreement of 99.64 per cent.

COMPARISON OF 280 DIAGNOSTIC FINGER BLOOD TESTS AND DIAGNOSTIC HEATED SERUM TESTS (SERUM OBTAINED FROM FINGER BLOOD)

In this group there was also only one disagreement, with a resulting total agreement of 99.64 per cent.

No false positive reactions were obtained by any method used, which accounts for the 100 per cent agreement in nonsyphilitic cases. Disagreements occurred in the syphilitic cases, the majority in patients with old cases under treatment and in patients with early primary syphilis. The finger blood test was positive in many of these cases, whereas the Wassermann tests and Kahn tests were negative. The few syphilitic patients who gave negative results with the diagnostic finger blood tests showed definite positivity in the exclusion finger blood tests. Therefore, these cases would not be missed if both the diagnostic and the exclusion tests were done. Although both tests were done in this series, the results of the latter (exclusion test) will not be reported until later. (A relatively small number of specimens of finger blood gave doubtful reactions in cases clinically classified as nonsyphilitic. In such cases the tests must be repeated before final evaluation is possible.)

The few patients with tuberculous infection and exanthematous diseases in this series did not show positive reactions in the finger blood test for syphilis. More tests are to be done on patients with febrile diseases to rule out the possibility of such patients showing false positive reactions.

COMMENT

Serologic tests are indispensable aids in diagnosis and are sometimes the sole means of detecting concealed cases of syphilis. In the present series, the finger blood test showed not only a high degree of

sensitivity and specificity but also gave immediate evidence as to the diagnosis and exclusion of syphilis. In order to report the most accurate results to the clinician, one should employ, in addition to this precipitation test, a complement fixation test, preferably with a sensitized antigen.

In this series of cases, the finger blood test performed alone would have given more correct information than the Wassermann and Kahn tests performed together.

The serodiagnosis of congenital syphilis has always been an important question. Children with a definite history of parental syphilis should be considered as syphilitic until proved otherwise. In this series there were several children of syphilitic parents who gave weakly positive reactions in the finger blood test, but negative reactions for the Wassermann and Kahn tests. Such doubtful reactions in the presence of a positive history, in spite of the absence of clinical evidence, are of significance. Wile expressed the belief that treatment should be instituted in children who show doubtful or positive reactions in spite of the absence of clinical findings because of the development of serious late consequences such as interstitial keratitis and involvement of the central nervous system. He also maintained that regardless of the absence of clinical or serologic observations, it seems wise to treat infants born of mothers who have syphilis, to supplement the prenatal treatment of the mother. Only after constant repetition over a period of several years, with negative results and with the absence of definite clinical manifestations, can one safely say that in all probability the child has escaped the infection. In older children the possibility that the parental syphilis has been acquired after the birth of the child must be considered.

The simplicity of the finger blood test must not be overemphasized. It is generally true that the so-called simple procedures turn out to be much more difficult in actual performance than the clinician is led to believe by the literature. Kahn stated that the simplicity of his test is overemphasized, and that for ideal results the antigen should be prepared as outlined by him and the tests performed by an experienced worker. The same is true of the Kline finger blood test. The antigen base can be purchased already prepared and standardized. The technic of the test is simple and the results easy to read. Due to the fact, however, that the specimens of finger blood are not heated, the hydrogen ion concentration of the water is of great importance. The water and saline should have a p_H of approximately 6. Another factor of importance is that a test of this type might be misused by some clinicians in office practice, in that doubtful reactions unsupported by clinical or other serologic evidence might be made the basis for the diagnosis of syphilis.

We agree with McIntyre and Gilman [5] that it is most important not to base final conclusions regarding the value of diagnostic tests on mere comparisons of various laboratory procedures, and that the value of any new laboratory test must be dependent on the agreement of the results with clinical observations. Although the present series includes only 545 tests and is too small to allow us to make final conclusions, it nevertheless gives some evidence of the reliability and comparatively great sensitivity of the finger blood test.

CONCLUSIONS

1. The Kline finger blood test has been found to be more sensitive than the Wassermann and Kahn tests and as sensitive as the heated serum microscopic slide precipitation test.

2. No false positive reactions occurred in any of the tests in this series.

3. The finger blood test gave results that agreed more frequently with the clinical condition of the patients than those of the Wassermann and Kahn tests.

4. Since this test requires but a small amount of easily obtainable finger blood, it is particularly useful in the diagnosis of syphilis in infants, children and obese patients in whom venepuncture is difficult. It is also useful in checking the suitability of blood donors immediately before transfusion. In addition, it may be used as a method for the immediate diagnosis of syphilis in a dermatologic clinic.

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5. McIntyre, M. C., and Gilman, R. L.: A Clinical Comparison of the Kolmer Modification of the Wassermann Test and the Kahn Precipitation Test in Syphilitic and Nonsyphilitic Cases, Am. J. M. Sc. **176**:843, 1928.

LIX.—LIPIDS OF THE SKIN

A REVIEW *

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The skin is one of the largest organs in the body, weighing, according to the data recorded by Vierordt,[1] approximately three times as much as the liver. It is surprising, therefore, that aside from a partial understanding of its obvious protective, heat-regulating and sensory functions, there is little knowledge of its physiologic activities or chemical composition and the factors that influence it. In the literature, moreover, there are many facts indicating the metabolic importance of the skin and suggesting that its functions may be as many and as varied as those of the liver.

An inherent metabolism in the skin has been established by demonstrating the presence of enzymes affecting many of the complex constituents of the blood stream. Through the efforts of Wohlgemuth and his co-workers,[2] and of Buschke and Klopstock [3] and Melczer,[4] the skin has been shown to contain an amylase, a diastase, glycolase, nuclease, tryptase, lipase, phenolase, catalase, phosphatase, sulphatase and carboxylase. Fahrig [5] and Wohlgemuth and Ikebata [6] found that skin, like other

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* Studies, observations and reports from the Dermatological Departments of the Barnard Free Skin and Cancer Hospital and the School of Medicine, Washington University, St. Louis, Mo., U. S. A., Service of Dr. M. F. Engman and Dr. W. H. Mook.

1. Vierordt, H.: Anatomische, physiologische und physikalische Daten und Tabellen, Jena, Gustav Fischer, 1906, p. 40.

2. Wohlgemuth, J., and Nakamura, Y.: Die Fermente der Haut: IV. Ueber den Zuckerabbau in der Haut, Biochem. Ztschr. **173**:258, 1926. Wohlgemuth, J., and Yamasaki, Y.: Ueber die Fermente in der Haut, Klin. Wchnschr. **3**:1113 (June 17) 1924. Nakamura, Y.: Ueber das Verhalten der Lipase und das Vorkommen von Phosphatase, Sulphatase und Carboxylase in der Haut, Biochem. Ztschr. **175**:216, 1926. Yamasahi, Y.: Ueber die Fermente der Haut, ibid. **147**: 203, 1924.

3. Buschke, A., and Klopstock, E.: Ueber Vorkommen und Bedeutung von Fermenten in der menschlichen Haut, Dermat. Wchnschr. **79**:1485 (Nov. 15) 1924.

4. Melczer, N.: Beiträge zur Kenntnis der Fermente der menschlichen Haut, Dermat. Ztschr. **49**:252, 1926.

5. Fahrig, C.: Ueber den Kohlenhydratumsatz der Geschwülste und ihrer normalen Vergleichsgewebe sowie seine Beziehungen zum Milchsäureaushalt des Körpers, Ztschr. f. Krebsforsch. **25**:146, 1927.

6. Wohlgemuth, J., and Ikebata, T.: Die Fermente der Haut: VIII. Ueber Milchsäurebildung in der Haut und ihre Beeinflussung durch verschiedene Strahlen-Arten, Biochem. Ztschr. **186**:43, 1927.

tissues, could produce lactic acid in vitro. Pillsbury [7] has recently made a study of the intrinsic lactic acid metabolism of the skin.

The skin has been found to be an important depot for the storage of several blood constituents. Folin, Trimble and Newman [8] injected dextrose into animals and found that considerable quantities had collected in the skin. Urbach and Sicher [9] and Trimble and Carey [10] have made studies of the sugar content of the skin in normal and pathologic conditions. Engels [11] and Skelton [12] found that the skin is second only to the musculature in importance as a water depot of the body. The studies of Wahlgren,[13] Padtberg,[14] Leva [15] and Geréb and Laszlo [16] indicate that sodium chloride may be temporarily stored in the skin. Urbach [17] found that residual nonprotein nitrogen of the skin increased in cases of nitrogen retention. Ellinger [18] showed that injected choline was stored in the skin. Milbradt [19] considered the skin to be an important depot for cholesterol.

Studies of the fat content and fat metabolism of the skin have been extremely limited, although their possible importance is indicated by the recent work on the activation of ergosterol by sunlight.

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7. Pillsbury, D. M.: The Intrinsic Carbohydrate Metabolism of the Skin, J. A. M. A. **96**:426 (Feb. 7) 1931.

8. Folin, O.; Trimble, H. C., and Newman, L. H.: The Distribution and Recovery of Glucose Injected into Animals, J. Biol. Chem. **75**:263, 1927.

9. Urbach, E., and Sicher, G.: Beiträge zu einer physiologischen und pathologischen Chemie der Haut: III. Der Zuckergehalt der Haut unter physiologischen und pathologischen Bedingungen, Arch. f. Dermat. u. Syph. **157**:160, 1929.

10. Trimble, H. C., and Carey, B. W.: On the True Sugar Content of Skin and Muscle in Diabetic and Non-Diabetic Persons, J. Biol. Chem. **90**:655, 1931.

11. Engels, W.: Die Bedeutung der Gewebe als Wasserdepots, Arch. f. exper. Path. u. Pharmakol. **51**:346, 1904.

12. Skelton, H.: The Storage of Water by Various Tissues of the Body, Arch. Int. Med. **40**:140 (Aug.) 1927.

13. Wahlgren, V.: Ueber die Bedeutung der Gewebe als Chlordepots, Arch. f. exper. Path. u. Pharmakol. **61**:97, 1909.

14. Padtberg, J. H.: Ueber die Bedeutung der Haut als Chlordepot, Arch. f. exper. Path. u. Pharmakol. **63**:60, 1911.

15. Leva, J.: Organuntersuchungen sowie experimentelle Studien über anhydropische Chlorretention, Ztschr. f. klin. Med. **82**:1, 1916.

16. Geréb, S., and Laszlo, D.: Ueber die Bedeutung der Haut für den Salz- und Wasserstoffwechsel, Klin. Wchnschr. **9**:775 (April 26) 1930.

17. Urbach, E.: Beiträge zu einer physiologischen und pathologischen Chemie der Haut: II. Der Wasser-, Kochsalz-, Reststickstoff- und Fettgehalt der Haut in der Norm und unter pathologischen Verhältnissen, Arch. f. Dermat. u. Syph. **156**:73, 1928.

18. Ellinger, P.: Ueber die Verteilung injizierten Cholins im Tierkörper, München. med. Wchnschr. **61**:2336, 1914.

19. Milbradt, W.: Lipämiestudien, Biochem. Ztschr. **223**:278, 1931.

My purpose in this paper is to give briefly some of the present concepts regarding the function and significance of various lipids and where possible to apply these ideas to the present meager knowledge of the lipids in the skin and particularly in the epidermis.

CLASSIFICATION OF LIPIDS

It is little over a quarter of a century ago that the attention of biochemists was turned, chiefly due to the works of Overton and Bang, to a study of the fatty constituents in tissue. Since then the lipids, or fatlike substances, have been recognized as essential constituents of protoplasm the quantitative relationships of which are intimately connected with function and activity. The terminology and classification of the fatty substances associated with living tissue have recently been simplified and rationalized by Bloor.[20]

Lipid is the general term applied to substances utilized by the living cell that are insoluble in water and soluble in the ordinary fat solvents and that have some real or potential relationship to the fatty acids as esters.

Simple Lipids: Esters of fatty acids with various alcohols.
  Fats: esters of fatty acids with glycerol.
  Waxes: esters of fatty acids with alcohols other than glycerol.

Compound Lipids: Esters of fatty acids containing some additional group.
  Phospholipids: substituted fats containing phosphoric acid and nitrogen.
  Glycolipids: compounds of fatty acid and carbohydrate containing nitrogen but no phosphoric acid.
  Aminolipids, Sulpholipids, etc.: groups that at present are not sufficiently well characterized to classify.

Derived Lipids: Substances derived from the foregoing groups by hydrolysis.
  Fatty acids of various series.
  Sterols: alcohols of high molecular weight found in nature combined with fatty acids, which are soluble in fat solvents.

The study of the lipids of the skin has been complicated by its structure. The epidermis and cutis, which are of different structure, function and embryonic origin, do not have the same lipid content. The relative thickness of these two parts of the skin varies in different regions of the body. The sebaceous glands of high lipid content also vary in size and number in the skin in different areas of the body. Even the layers of the epidermis, the lipid contents of which may be quite different, do not have the same relative thickness in the skin from all parts of the body. It is apparent, therefore, that in order to obtain comparable results for the lipid content of whole skin or epidermis, specimens for analysis must be taken from topographically similar parts of the body.

20. Bloor, W. R.: Biochemistry of the Fats, Chem. Rev. **2**:243, 1925.

The difficulties that are inherent in analyses of whole skin could, of course, be avoided by separating it into its component layers and analyzing them separately, a process involving technical manipulations bordering on the impossible.

Histochemical Studies.—Such studies are obviously free from the difficulties presented by chemical methods, since here the lipid is shown "in situ" in a thin section of tissue, and dissection or separation of the skin layers before analysis is unnecessary. A number of staining methods have been developed to demonstrate the presence of lipid and lipid groups, making use of such fat dyes as sudan III, scharlach R and nile blue, and of various staining reagents such as osmic acid, hematoxylin and chromic acid. The polarizing microscope has also proved to be a valuable instrument in revealing anisotropic lipids (cholesterol esters) in tissue sections. These methods have been tried out on thin sections of tissue paper or on elderberry pith impregnated with the lipid under investigation. The lipids in the tissue are found in a much more complex chemical and physical state than that of the pure isolated lipid exposed on a piece of pith, and would not be expected to react in the same way toward a dye or other reagent. Kaufmann and Lehmann,[21] after a careful investigation of the more common reactions used to identify lipids and lipid groups histochemically, concluded that as yet no dye has been found that can lay claim to absolute specificity for any lipid group, to say nothing of individual substances in those groups, and that the only reliable method is by qualitative and quantitative chemical analysis. Negative histochemical findings do not necessarily mean that lipids are absent. Positive findings are of value and yield information concerning the location and distribution of lipid, but cannot be interpreted to give an accurate picture of conditions as they existed in the living cell because their appearance in the stained section may be an artefact. By far the most work on the lipids of the skin has been done in the field of histochemistry. Some of the more important findings will be included in the following sections.

Fats.—The fats, which constitute largely the fat depots of the body, are simple esters in which three molecules of fatty acid have combined with the three alcohol groups of glycerol. Chemically, they are rather inactive, and because of their high caloric value they provide a convenient form in which to store food. Physically, the fats in the peripheral subcutaneous tissues provide a cushion for the protection of the body, and because of their poor heat-conducting property form an

21. Kaufmann, C., and Lehmann, E.: Sind die in der histologischen Technik gebrauchlichen Fettdifferenzierungsmethoden Spezifische? Arch. f. path. Anat. u. Physiol. **261**:623, 1926.

excellent insulating layer, helping to prevent sudden changes in the temperature of internal organs with changes of environmental temperature.

When the lipid content of a tissue is changed by altering the nutritional state of the person, the fat fraction will show the greatest variation. The fats are inconstant constituents of protoplasm. A beautiful example of the variations that may occur in the fat content of a tissue with radical changes in the nutrition of the body are the data of Klose [22] on the fat content of the skin of fifty infants dying of various metabolic disturbances. Investigation of his methods reveals that he did not determine fat but the total ether-soluble material, and that what he analyzed was not skin but skin plus panniculus adiposus. He was very careful to use skin from a similar part of the cadaver for each analysis, but no attempt was made to remove the subcutaneous fat. He recorded values varying from 0.1 to 50 per cent of the weight of the skin. I have not been able to find a value for the fat content of the skin reported in the literature. Unna and Golodetz [23] have called one of their fractions of skin lipids neutral fat, and they found that 88.4 per cent of the lipids of the epidermis and 83.7 per cent of the lipids of the horny layer were in this fraction. Unna's neutral fat, however, is not what is understood by neutral fat today, but includes all of the lipids that are soluble in ether after titration with tenth-normal alcoholic potassium hydroxide. This would include all of the lipids except those that are extremely easily hydrolyzed and the free fatty acids. Nicolau [24] found sudanophil particles in the skins of persons of widely different ages. They were more numerous in the hirsute regions of the body, and age, sex and obesity seemed to have no effect on their distribution. They were most abundant in the stratum germinativum, and were found to be absent in the keratinized layers of the epidermis. Unna,[25] on the other hand, found that the horny layers were stained black by osmic acid, a reaction that is given by oleic acid and its esters, and designated oleic acid as "das Eigenfett der Hornschicht." The surface of the skin is stained by both osmic acid and fat dyes, owing perhaps to the imbibition of fats secreted by the sebaceous glands.

Waxes.—Esters of fatty acids with the alcohol cholesterol come under the classification of waxes. Cholesterol esters are normally found

22. Klose, E.: Zur Kenntnis der Korperzusammensetzung bei Ernährungs-Störungen: II. Der Chemismus der Haut bei Ernährungsstörungen, Jahrb. f. Kinderh. **91**:157, 1920.

23. Unna, P. G., and Golodetz, L.: Die Hautfette, Biochem. Ztschr. **20**:469, 1909.

24. Nicolau, S.: Recherches histologiques sur la graisse cutanée, Ann. de dermat. et syph. **2**:641, 1911.

25. Unna, P. G.: Histochemie der Haut, Vienna, Franz Deuticke, 1928, p. 113.

in blood plasma, the suprarenals, the testes and the corpora lutea. With these exceptions they do not occur except in infinitesimal amounts in the lipid extracts of normal active tissues.[26] Valentin[27] found considerable quantities of cholesterol ester in the degenerating adipose tissue of the pig. Bloor, Okey and Corner[28] found that the cholesterol ester content of the corpus luteum was greatest during the period of degeneration. A high cholesterol ester content, then, is often associated with tissue degeneration. The horny layers of the epidermis may be regarded as degenerated cells of the basal layers. Unna and Golodetz[23] found that half of the cholesterol extracted from material sliced from the sole of the foot was combined as cholesterol esters. For the entire epidermis these workers reported values that indicate that 87 per cent of the cholesterol is in the uncombined form, which agrees remarkably well with values reported by Eckstein and Wile[29] for exfoliative epidermis. Schmidt[30] has observed anisotropal particles in the epidermis, particularly in the sebaceous glands, which were more abundant in children than in adults.

Phospholipids.—Phospholipids are compound lipids that contain in their molecule, in addition to fatty acids and glycerol, a nitrogenous base and phosphoric acid. Through the efforts of MacLean and Levene, this group has been limited to three well defined generic substances: lecithin, cephalin and sphingomyelin. These substances are optically and chemically active. They are universally found in living cells. Mayer and Shaeffer[31] have shown that the amount of these substances in a given tissue remains remarkably constant even when the animal has been starved to death. For this reason they are included in the nonvariable lipids of tissues. Mayer, Rathery and Shaeffer[32] have shown by histologic and chemical studies that the mitochondria of cells have physical

26. Onizawa, J.: Studies on the Behavior of Cholesterol Within the Animal Body: II. The Content of Free and Ester Cholesterol in the Various Tissues of Normal Rabbits, J. Biochem. **10**:409, 1929.

27. Valentin, F.: Beitrag zur Kenntnis der Cholesterinesterverfettung, Ztschr. f. physiol. Chem. **98**:73, 1916.

28. Bloor, W. R.; Okey, Ruth, and Corner, G. W.: The Relation of the Lipids to Physiological Activity: I. The Changes in the Lipid Content of the Corpus Luteum of the Sow, J. Biol. Chem. **86**:291, 1930.

29. Eckstein, H. C., and Wile, U. J.: The Cholesterol and Phospholipid Content of the Cutaneous Epithelium of Man, J. Biol. Chem. **69**:181, 1926.

30. Schmidt, M. B.: Ueber vitale Fettfarbung im Geweben und Sekreten durch Sudan und Geschwülstartige Wucherungen der ausscheidenden Drüsen, Virchows Arch. f. path. Anat. **253**:432, 1924.

31. Mayer, A., and Shaeffer, G.: Recherches sur la teneur des tissues en lipoides, J. de physiol. et de path. gén. **15**:773, 1913.

32. Mayer, A.; Rathery, F., and Shaeffer, G.: Les granulations ou mitochondries de la cellule hépatique, J. de physiol. et de path. gén. **16**:607, 1914.

and chemical properties similar to those of phospholipids and that there is a close parallelism between the phospholipid and mitochondria content of a tissue. As pointed out by Cowdry [33] there is abundant evidence to show that mitochondria play an important part in the physiologic activities of the cell. Cells with a high degree of physiologic activity should have a relatively high phospholipid content. Bloor [34] has determined the lipid content of a number of tissues of the ox and has found that when these are arranged in order of their phospholipid content, this order is also that of their physiologic activity. Eckstein and Wile [35] found that the lipids of a xanthomatous tumor contained two hundred times as much phospholipid as those of panniculus adiposus. Bloor [36] has reported that malignant tumors contain about three times as much phospholipid as do benign tumors, and that during lactation the phospholipid content of the mammary gland of the rabbit is doubled.

The cells of the stratum germinativum of the epidermis are very active and are continually multiplying. They contain large numbers of mitochondria, which Ludford [37] has shown are polarized in the lower layer of cells, being concentrated in the cytoplasm proximal to the cutis. As the cells move to higher strata, the mitochondria become scattered and diminish in number until in the cornified layers of the stratum lucidum and stratum corneum they may be entirely absent. One would expect to find, then, a very different phospholipid content for the stratum germinativum than for the stratum corneum. Unhappily, the literature on the phospholipid content of skin is so meager that there is no way of knowing how well these concepts are borne out. The changes that take place in the lipids of the epidermal cells during the process of keratinization offer an interesting problem for chemical study. A fundamental study of the phospholipid content of the skin and the factors that might influence it, such as age, sex, nutrition or exposure to sunlight, is very much to be desired. Eckstein and Wile [29] have reported the phospholipid content of human cutaneous epithelium to be from 0.19 to 0.23 per cent of the tissue or from 2.5 to 3.15 per cent of the total lipids. The material analyzed was exfoliated skin from patients

33. Cowdry, E. V.: The Mitochondrial Constituents of Protoplasm, Contrib. Embryol. **8**:1, 1918.

34. Bloor, W. R.: Distribution of Unsaturated Fatty Acids in Tissues: I. Beef Heart Muscle, J. Biol. Chem. **68**:33, 1926; II. Voluntary Muscles of Beef, ibid. **72**:327, 1927; III. Vital Organs of Beef, ibid. **80**:443, 1928.

35. Eckstein, H. C., and Wile, U. J.: Lipid Studies in Xanthoma, J. Biol. Chem. **87**:311, 1930.

36. Bloor, W. R.: Phospholipid Content and Physiological Activity of Tissues, Proc. Soc. Exper. Biol. & Med. **27**:294, 1930.

37. Ludford, R. J.: Cell Organs During Keratinization in Normal and Malignant Growth, Quart. J. Micr. Sc. **69**:27, 1924.

with various skin diseases. Whether the inflammatory processes that cause desquamation of the skin have any effect on the lipids has not yet been determined.

Sterols.—Sterols are complex alcohols of high molecular weight belonging to the terpene series. They are found in the unsaponifiable fraction of the lipids of practically all living cells. Cholesterol is the best known member of this group and is the characteristic sterol of animal tissues. Knowledge concerning its chemistry and constitution was presented by Windaus and also by Wieland, who has worked with a structurally similar series of bile acid derivatives. The ubiquity of cholesterol in living cells and its spectacular appearance in such common conditions as cholelithiasis and atherosclerosis have stimulated a great deal of interest and investigation. Very early, investigators were provided with methods for its determination, and an enormous literature has accumulated regarding it. In spite of the vast amount of study this compound has received, there is very little known for certain of its function in the animal body. Mayer and Shaeffer,[31] in their analyses of animal tissues under widely different nutritional conditions, found that for animals of the same species the cholesterol as well as the phospholipid content remained surprisingly constant. Cholesterol must also be classed with the nonvariable lipids.

While phospholipids and cholesterol are both lipids and have some properties in common, they have many that are quite different. Cholesterol is a relatively stable and inert substance. It does not readily decompose or undergo chemical change at ordinary temperatures. Phospholipids, on the other hand, are extremely labile and reactive, are easily hydrolyzed and oxidize spontaneously on exposure to the air. A concept that has gained rather general acceptance is that cholesterol and phospholipid are antagonistic in their action. The classic example of this antagonism is their opposite effect on the hemolysis of red blood cells by saponins or snake venoms. Cholesterol prevents hemolysis, while lecithin enhances it. Cholesterol apparently has an inhibitory effect on the reactivity of the phospholipid; therefore, the ratio of these two lipids rather than the absolute amounts should express more accurately their resultant effect and the physiologic activity of a tissue. With increased physiologic activity the cholesterol content is usually increased, but not to the same extent as is the phospholipid, so that the ratio of phospholipid to cholesterol would still indicate an increased activity. Burgheim [38] reported that there is more cholesterol in malignant than in benign tumors. Bloor [36] has stated that the cholesterol content is twice as high, but that the phospholipid content is three times as high in the

38. Burgheim, F.: Ueber Beziehungen zwischen Krebs und Lipoidstoffwechsel, Klin. Wchnschr. **8**:828 (April 30) 1929.

malignant as in the benign tumor. The xanthomatous tumor analyzed by Eckstein and Wile [35] contained approximately two hundred times as much cholesterol in its lipid fraction as was found in the lipids of the subcutaneous fatty tissues.

One of the most striking things about the lipids of the skin is their high cholesterol content. Unna and Golodetz [23] found that 16.1 per cent of the lipid extracted from the epidermis of the sole was cholesterol. Eckstein and Wile [29] found values ranging from 13 to 24 per cent of the total lipid for the cholesterol content of desquamated cutaneous epithelium. Jono [39] analyzed the exfoliated skin of Japanese patients with scarlet fever and found that 25 per cent of the lipids were in the unsaponifiable fraction, but he gave no value for the cholesterol content. Rosenbaum [40] found that eczema scales contained 11.5 per cent of cholesterol. Bürger and Schlomka [41] have made a careful study of the cholesterol content of whole skin and its variation with age. Taking care to analyze a similarly prepared specimen of skin from a topographically similar part of the body, they found that the cholesterol content steadily diminished with increasing age, beginning with a value of 0.211 per cent at an age of 2 weeks and decreasing to a value of 0.104 per cent at an age of 70 years. These values are for moist skin; the corresponding figures calculated for dry skin are 0.872 per cent at 2 weeks and 0.267 per cent at 70 years. The values of Eckstein and Wile [29] for the skin epithelium are from 0.58 per cent to 1.7 per cent of the material analyzed, showing that the cholesterol content of the epidermis is considerably higher than that of whole skin. Kawaguchi [42] has studied the effect of irradiation on the cholesterol content of the skin of guinea-pigs, and he reported that a considerable increase occurs in the cholesterol of the skin following intensive irradiation with natural sunlight, a less marked increase with the ultraviolet rays and no increase with the x-rays. Roffo [43] has determined the cholesterol content of the skin of the face and abdomen in a large series of patients with malignant conditions of the integument and has compared these with values obtained for persons without malignant conditions. The values found for the skin of the face, calculated for the dry weight, varied from

39. Jono, Y.: Ueber die chemische Zusammensetzung der menschlichen Epidermis, J. Biochem. **10**:311, 1929.

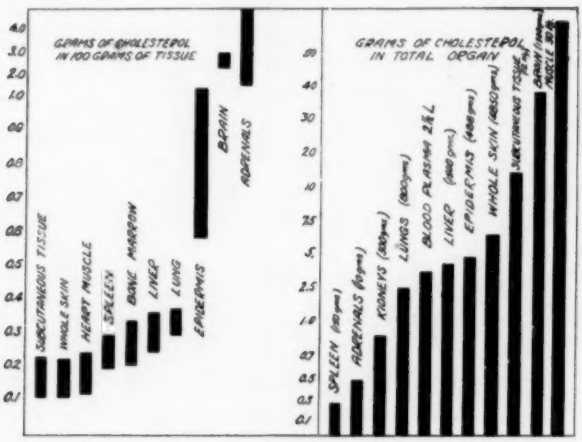
40. Rosenbaum, S.: Ueber die chemischen Eigenschaften von Nährungsfetten verschiedener biologischer Wertigkeit, Biochem. Ztschr. **109**:271, 1920.

41. Bürger, M., and Schlomka, G.: Beiträge zur physiologischen Chemie des Alterns der Gewebe: IV. Untersuchungen an der menschlichen Haut, Ztschr. f. d. ges. exper. Med. **63**:105, 1928.

42. Kawaguchi, S.: Ueber den Einfluss der Lichtstrahlen auf den Gesamt-Cholesteringehalt der Haut, Biochem. Ztschr. **221**:232, 1920.

43. Roffo, A. H.: La cholestérine de la peau, J. de physiol. et de path. gén. **27**:541, 1929.

0.50 to 1.87 per cent, and for the abdominal skin, from 0.17 to 0.95 per cent. The normal subjects showed lower and more constant values; for the skin of the face, from 0.35 to 0.73 per cent, and for abdominal skin, from 0.16 to 0.37 per cent. The skin of the exposed parts of the body evidently has a much higher cholesterol content than that which is protected. Roffo expressed the belief that there may be a close relationship between the cholesterol content and the predisposition of a tissue toward malignant processes. In support of this view, he pointed out that neoplastic and precancerous tissues have a cholesterol content corresponding to that found in the skin of the face, and he presented data showing the high incidence of cancer of the face and exposed parts of the body as compared to those that are protected. Wahl [44] has made rather extensive histochemical studies of the distribution of cholesterol



The distribution of cholesterol in various body tissues.

in the skin and has found that it is most abundant in the skin of the head and armpits and least in the skin of the abdomen. After a study of fifty-one patients dying of diseases characterized by abnormal cholesterol levels of the blood, he concluded that very little correlation exists between the cholesterol content of the blood and that of the skin.

In the accompanying chart I have added values for the cholesterol content of whole skin and epidermis to those given by Hueck [45] in his excellent review on cholesterol. This shows the position that the skin occupies in relation to the other organs of the body with respect to the cholesterol content.

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44. Wahl, S.: Histochemische Untersuchungen über Vorkommen und Lokalisation der Lipoide in der Haut, Arch. f. Dermat. u. Syph. **156**:286, 1928.

45. Hueck, W.: Referat über den Cholesterinstoffwechsel, Verhandl. d. deutsch. path. Gesellsch. **36**:18, 1925.

Another sterol that is present in the lipids of the skin in small amounts is ergosterol. Ergosterol has recently attracted much attention because of its close relationship to the antirachitic vitamin. Since the vitamin is formed from ergosterol by irradiation and the logical or only possible site of irradiation is the skin, its ergosterol content is extremely important and interesting. Hentschel and Schindel,[46] using a spectroscopic method, found that the sterols of adult skin contained 0.42 per cent of ergosterol, while those of newly born infants contained but 0.15 per cent. These figures bear out the clinical experiences of the necessity of supplying the antirachitic vitamin during the first few months of life.

About half of the unsaponifiable fraction of skin lipids is made up of cholesterol. The remainder is a complex mixture of quite unknown substances, a study of which should be extremely interesting.

Fatty Acids.—The most important saturated fatty acids found in animal tissues are palmitic and stearic acids containing 16 and 18 carbon atoms, respectively. Lipids of all tissues yield saturated fatty acids on hydrolysis, but the quantity relative to the fatty acids of the unsaturated series depends on the nature of the tissue. The inactive fat stores of the body contain large quantities of saturated fatty acids, while the more active tissues contain relatively smaller quantities.

The most important unsaturated fatty acids occurring in animal tissues are oleic acid with one unsaturated group, linoleic with two and arachidonic with four. Linolenic with three double bonds is not found except in small amounts in animal lipids. The unsaturated fatty acids are found largely in the phospholipid fraction, and for this reason they should reflect the physiologic activity of the tissue in which they are found. The data of Bloor [34] for the unsaturated fatty acid content of various muscles of the ox bear this out very well.

Eckstein and Wile [29] found that the fatty acids in a composite of lipid extracts of exfoliated skin contained approximately the same distribution of saturated and unsaturated fatty acids as those of the subcutaneous tissues.

SUMMARY

Some of the modern concepts concerning the significance of lipids in the living cell have been presented. Where possible they have been applied to the skin lipids,. particularly those of the epidermis. A number of problems have been suggested.

46. Hentschel, H., and Schindel, L.: Ergosterinnachweis im menschlicher Haut, Klin. Wchnschr. **9**:262 (Feb. 8) 1930.

ROENTGENOTHERAPY OF THE SPINAL REGION IN DERMATOLOGY*

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Since the advent of roentgen rays in dermatologic therapy, their direct action having been utilized in the treatment of cutaneous lesions for more than thirty years, repeated efforts have been made to extend their field of usefulness. When direct roentgen action has failed or has been found unsatisfactory, and when other means of treatment have not proved wholly successful, methods have been sought that might strike at the pathogenesis of the disease or that might be effective by acting indirectly on biologic or physiologic activities. Examples of this type of roentgenotherapy are the Brock method of irradiating the thymus region in psoriasis and the treatment for lupus erythematosus by irradiation of the regional lymph nodes. Indirect roentgenotherapy has been directed to the thyroid, the ovaries, the hypophysis, the liver, the spleen, the suprarenal glands, the vegetative nervous system, the spinal cord, its roots and ganglions, and large cutaneous fields. This work has been largely experimental and based on hypothetic considerations, and much of it has been barren of practical results, though intriguing to the investigator and valuable in pointing the way to larger possibilities in the utilization of physical agents.

One of the promising fields of indirect roentgen irradiation is that which concerns itself with the region of the spine. The method used has been variously referred to as radicular therapy, sympathetic irradiation and spinal roentgen treatment. This paper will be confined to a consideration of this special form of therapy, and is based on a review of the literature on the subject and the deductions drawn from personal observations in ninety-eight cases (lichen planus, thirty-three cases; dermatitis herpetiformis, twenty-two; generalized chronic lichenified eczema and neurodermatitis, thirteen; genital and anal pruritus, nine; scleroderma, five, and herpes zoster, sixteen). A few brief case reports will be submitted.

Priority in the treatment for cutaneous disorders by roentgen irradiation of the region of the spine probably belongs to Zimmern and Cottenot,[1] who first employed this method in 1913 in the treatment for resistant senile pruritus, genital pruritus and generalized lichenified eczema. In the treatment for disease, this method had an earlier origin,

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1. Zimmern and Cottenot: Presse méd. **36**:564, 1927.

having been employed by Bordier in the treatment for anterior poliomyelitis and the posteruptive neuralgia of zoster. An impetus was given to this type of roentgenotherapy by its use in lichen planus, apparently first carried out in 1919 by Zimmern and Cottenot [1] and by Gouin,[2] though credit belongs to Pautrier [3] for the first presentation and publication of this subject.

GENERAL CONSIDERATIONS

The advocacy of spinal therapy brings up the query as to its mode of action, and on this point there are many hypotheses and some interesting experimental and clinical observations. It is known that nerve tissue is particularly resistant to the destructive action of x-rays, and that histologically demonstrable changes are difficult to produce, but whether or not such tissue is influenced in its biologic or physiologic action by irradiation has not been conclusively proved. Neither is it known whether x-rays, when directed at nerve tissue in fractional dosage, stimulate or depress nerve activities or fail to influence them, or whether they act indirectly through an influence on the blood supply or vascular endothelium or on pathologic cellular infiltrates the absorption or destruction of which might produce clinical reactions.

However, Marburg and Sgalitzer [4] quoted Ricker as concluding from experimental investigations that roentgen rays act primarily on the vegetative nerve supply of the blood vessels and secondarily on the capillary endothelium, causing an immediate capillary dilation followed in a few hours by capillary constriction. Ricker considered these nerve endings the most radiosensitive of nerve tissues. He claimed to have shown experimentally that weak roentgen exposures stimulate the dilator fibers and that strong ones stimulate the depressor fibers. Strauss [5] concluded, from animal experimentation, that the action of x-rays on nerve tissue is accomplished by a disturbance of cell lipoids. If by means of irradiation the cholesterol content is reduced, the lecithin will be increased and the cell membrane will become more permeable. This, in Marburg's opinion, would result in physiologic changes. David [6] expressed the belief that the sympathetic system can be influenced by either superficial or deep irradiation and that the most pronounced general effect is a reduction of sympathetic tone. He stated that the best known local effect of irradiation, erythema, is the result of a localized reduction of sympathetic tone. In experimental irradiation of the

2. Gouin: Bull. méd., Paris **38**:1015, 1924.

3. Pautrier: Bull. Soc. franç. de dermat. et de syph. **31**:67, 1924.

4. Marburg and Sgalitzer: Die Röntgenbehandlung der Nervenkrankheiten, in Meyer: Sonderbände zur Strahlentherapie, Berlin, Urban & Schwarzenberg, 1930.

5. Strauss, quoted by Marburg and Sgalitzer (footnote 4).

6. David: Strahlentherapie **26**:419, 1927.

vegetative nervous system, Gabriel [7] observed an increase of vagus tone and a depression of sympathetic tone. In Blumenthal's [8] belief, indirect roentgenotherapy is similar to nonspecific shock therapy. Schoenhof [9] considered the effect of x-rays to be in the nature of a depressor action on irritated nerve structures.

In spinal roentgenotherapy a further question is that of the site of action of irradiation. Does the effect occur in the cord itself, the posterior nerve roots, the spinal ganglions, the sympathetic nerve plexuses or the cutaneous nerve fibrils of the autonomic nervous system? Does the site of action vary because different nerve tissues may be involved by the pathologic process in different diseases? The term radicular therapy implies action on the nerve roots. In herpes zoster,[10] in which there is known to be a pathologic process in the posterior nerve roots, it may be logical to assume that direct roentgen action may occur in the roots and in that manner influence the course of the disease or its symptoms. The presence of a medullary neuropathologic process in most of the other diseases referred to is speculative. Pautrier and Hufschmitt are among those who believe that the pathogenesis of lichen planus may involve the spinal cord and its radicals, the roots and ganglions, and that these tissues are in some manner affected by x-rays. Kreibich [11] expressed the belief that in eczema and neurodermatitis the epidermal irritation brings about efferent vascular changes that receive their stimuli from the spinal cord. He therefore sought to influence pruritus by spinal irradiation. In the lichenoid eruptions, characterized by hyperkeratosis, Samberger [12] observed what he terms the hyperkeratotic diathesis. In his opinion, the therapeutic effect of radicular roentgenotherapy results from weakening of the vitality of the keratotic tissue; he offered no explanation of how he arrived at this hypothesis.

Many clinical observations favor consideration of the sympathetic nervous system as the site of action of roentgen rays in spinal irradiation. Gouin [13] argued this point by the demonstration of cases of generalized lichen planus with extensive lesions on the lower extremities that had cleared up following irradiation of the interscapular area of the spine, the site of the superior sympathetic nerve plexus. Gouin [14] further advanced his case by the demonstration of results similar to those obtained by spinal irradiation, when he irradiated the axillae and

7. Gabriel: Strahlentherapie **34**:813, 1929.
8. Blumenthal: Zentralbl. f. Haut- u. Geschlechtskr. **25**:29, 1928.
9. Schoenhof: Fortschr. a. d. Geb. d. Röntgenstrahlen **35**:1065, 1927.
10. Glaubersohn: Dermat. Wchnschr. **87**:1422, 1928.
11. Kreibich: Dermat. Wchnschr. **91**:1198, 1930.
12. Samberger: Dermat. Wchnschr. **86**:221, 1928.
13. Gouin: Zentralbl. f. Haut- u. Geschlechtskr. **25**:411, 1928.
14. Gouin and Bienvenue: Bull. Soc. franç. de dermat. et de syph. **36**:96, 1929.

Scarpa's triangle, fields that possess a rich sympathetic supply. Gay Prieto [15] expressed the belief that the results of spinal therapy are attributable to the biologic effect of irradiation of large cutaneous fields, and he sought to prove this by demonstrating a case of lichen planus in which the eruption had involuted following irradiation of the skin of the abdomen. Gouin and Bienvenue [16] pointed out that their method of sympathetic irradiation and the Leriche operation of periarterial sympathectomy produce similar vasomotor reactions, hyperleukocytosis and reduction of blood pressure, and similar clinical results in certain diseases. Leriche and Fontaine stated that sympathectomy suppresses pathologic sympathetic reflexes.

TECHNIC OF TREATMENT

There are two distinct methods of applying the roentgen rays to the spinal region, each of which has been variously modified. The first of these, known as "radicular" therapy, was introduced by Bordier in the treatment for poliomyelitis and is directed to the spinal cord and its roots. As modified by Pautrier in the treatment for lichen planus, it has become known as the Strasbourg technic. As first employed by Pautrier,[3] it consisted in dividing the spinal region into five fields from the first dorsal to the fifth lumbar vertebra. A 5 mm. aluminum filter was employed, and a dose of 4 Holzknecht units was directed perpendicularly to each field. Usually only one treatment was applied. (According to the interpretation of Hirsch [17] and Holzknecht, a dose of 4 Holzknecht units with a 1 mm. aluminum filter equals approximately 30 per cent of the unit skin dose, and a dose of from 3 to 4 Holzknecht units with a 3 mm. aluminum filter equals from 30 to 40 per cent of the unit skin dose). Hufschmitt [18] modified the Bordier technic, irradiating perpendicularly from the fifth cervical to the first lumbar vertebra through a 5 mm. aluminum filter for a dosage of 3 Holzknecht units to each of four or five fields. Zimmern and Cottenot employed a dose of from 1 to 1½ Holzknecht units, through a 3 mm. aluminum filter for five doses at daily intervals, directed to the spinal cord and its nerve roots. Pautrier subsequently adopted the Bordier method of dividing the spinal region into eight fields, four on each side, and irradiating obliquely toward the midline at an angle of 45 degrees. Each field received a dose of 3 Holzknecht units through 5 mm. of aluminum. Schoenhof [9] modified the Bordier technic, irradiating either the dorsal or lumbar region, or the entire spine, by a cross-fire method.

15. Gay Prieto: Zentralbl. f. Haut- u. Geschlechtskr. **25**:414, 1928.
16. Gouin and Bienvenue: Zentralbl. f. Haut- u. Geschlechtskr. **30**:812, 1929.
17. Hirsch: Physikalisch-technische Grundlage der Röntgentherapie, Berlin, Julius Springer, 1927, p. 221.
18. Hufschmitt: Bull. Soc. franç. de dermat. et de syph. **31**:71, 1924.

He used a filter of 0.5 mm. of zinc and 1 mm. of aluminum, delivering one-third erythema dose to each field, which was repeated in from six to eight weeks and again in two months if necessary. The fields measured 6 by 20 cm. each, the voltage used was 100 kilovolts and the focal skin distance 30 cm. Only the segments of the cord concerned in the nerve distribution to the areas of involved skin were irradiated. Schoenhof obtained good results with this technic after he had failed when using from 0.5 to 3 mm. of aluminum.

The "sympathetic" technic was introduced by Gouin [19] who employed unfiltered or lightly filtered x-rays and directed them to a superior or principal sympathetic field and an inferior or accessory field. The first field was located in the interscapular area and centered at the fourth dorsal vertebra, and the second was in the dorsolumbar region and centered at the twelfth dorsal vertebra. In cases of acute lichen planus, unfiltered x-rays were employed in a dose of from 4 to 5 Holzknecht units, with a 12 inch (30 cm.) point spark gap, and a 7 benoit ray. In some cases the treatment was confined to a single exposure directed to the interscapular field. Gouin's usual method was to apply a single dose to the principal field and a second similar dose in two or three weeks to the accessory field. Treatments were repeated only when necessary and then in from three to six weeks in a single dose of 4 Holzknecht units through a 1 mm. aluminum filter. In chronic cases a 1 or 2 mm. aluminum filter was employed, and in the presence of oral lesions a 3 or 4 mm. aluminum filter, in a dose of 3 or 4 Holzknecht units. In cases of resistant oral lesions the cervical region was also irradiated, employing a filter of 2 or 3 mm. of aluminum and a dose of 3 Holzknecht units.

Louste, Levy-Franckel and Juster [20] have expressed a preference for a dosage of 6 Holzknecht units through 3 mm. of aluminum directed to each of the two spinal sympathetic fields. Neumark and Krynski [21] exposed the sympathetic fields to from 3 to 6 Holzknecht units with from 3 to 4 mm. of aluminum, at a target skin distance of from 25 to 30 cm., with a 28 to 30 cm. spark gap and a 2.5 ma. current. From three to seven exposures were given monthly, depending on the indications. Nijkerk [22] modified the Gouin technic by cross-firing small fields and employing fractional dosage on successive days for a total of 5 Holzknecht units. Driver [23] used the superficial unfiltered method

19. Gouin: Bull. Soc. franç. de dermat. et de syph. **32**:80, 1925.

20. Louste, Levy-Franckel and Juster: Zentralbl. f. Haut- u. Geschlechtskr. **25**:413, 1925.

21. Neumark and Krynski: Strahlentherapie **25**:426, 1927.

22. Nijkerk: Zentralbl. f. Haut- u. Geschlechtskr. **23**:767, 1927.

23. Driver, J. R.: Roentgen Ray Treatment of the Spine in Lichen Planus, Arch. Dermat. & Syph. **19**:620 (April) 1929.

with from one half to five eighths of an erythema dose to the interscapular and dorsolumbar regions, and the filtered method with the same dosage and to the same fields through 3 mm. of aluminum. With unfiltered x-rays he used 100 kilovolts and with filtered x-rays 113 kilovolts. From one to three treatments were given at intervals of from two to four weeks.

In the series of cases reported in this paper the interscapular and dorsolumbar fields of Gouin were chosen, each field measuring approximately 10 by 20 cm. The central rays were directed to the fourth and twelfth dorsal vertebrae. One-half erythema dose was delivered through a 3 mm. aluminum filter at 124 kilovolts by sphere gap measurement, with a 5 ma. current and at a target skin distance of 12 inches. The Coolidge tubes used had been standardized for erythema dosage at these settings by spectrometric calculations. Single treatments were usually given; some were repeated at intervals of three weeks and others after longer periods.

LICHEN PLANUS

Pautrier and Diss [24] have made interesting observations on careful histologic studies of lichen planus that suggest the possibility of a neurogenic origin or influence in this disease. In the earliest stage of development of the lichen planus papule they have found numerous tactile cells of Merkel, grouped near the orifices of the sweat ducts singly or in twos or threes, and present in much greater numbers than normal. These are held to be significant as the predominant elements of the early lesion. In the cutis they observed spindle-shaped and star-shaped cells with nuclei similar to those of the Merkel-Ranvier cells and with long threadlike filaments. These filaments were recognized as communicating with nerves. They also described the polymorphonuclear cells and epithelioid giant cells observed in this disease by Sabouraud [25] and recognized as characteristic cells in herpes zoster. Their observations were made in all specimens of fourteen cases of lichen planus, and were not observed in any of an equal number of sections of lichenification.

These histologic evidences of a neurogenic element in the lichen planus lesions, the occasional zosteriform distribution of a lichen planus eruption and the frequent evidence of subjective manifestations of a disturbed nervous system in patients with lichen planus favor consideration of the nervous system as being involved in the etiology or pathogenesis of this disease. These thoughts and the beneficial though temporary results following spinal puncture in lichen planus (Ravaut)

24. Pautrier and Diss: Bull. Soc. franç. de dermat. et de syph. **34**:522, 1927.
25. Sabouraud: Bull. Soc. franç. de dermat. et syph. **32**:521, 1925.

led Pautrier to consider the possibility of influencing this disease by irradiation of the spinal cord and its radicals.

In March, 1924, Pautrier [3] exhibited a patient whom he had treated by roentgen irradiation of the spine two months previously because of an acute generalized eruption of lichen planus of two weeks' duration. Ten days after the treatment the intense pruritus had disappeared and the lesions had lost their inflammatory appearance and were involuting; at the end of four weeks the eruption was completely healed. No other treatment had been employed. Hufschmitt,[18] in ignorance of Pautrier's work, used this treatment for the first time within a month of the latter, and in a second case shortly afterward. His results were also distinctly favorable. An interesting observation in one of Hufschmitt's cases was a sudden intensification of the subjective and objective symptoms and an extension of the eruption on the twelfth day after the treatment, shortly followed by complete subsidence of the manifestations of the disease. Pautrier considered this to be in the nature of a Herxheimer reaction, and it is a not uncommon accompaniment of the treatment.

Since then this method of treating lichen planus has been used extensively, particularly in France, and with favorable results. The only report on this subject by an American is that by Driver,[23] in 1928. His work was confined to the treatment for lichen planus, and his results and observations encouraged me to investigate this subject in relation to other dermatoses as well as lichen planus.

In 1924, Gouin [19] reported eleven cases in which treatment by superficial irradiation of the superior sympathetic field was successful. He observed that in most cases, about eight hours after the treatment, an intensification of pruritus occurred, lasting from three to five hours and associated with an exacerbation of the eruption. Two or three days later the eruption began to involute, first on the chest and back, then on the upper and finally on the lower extremities. In acute cases the eruption usually disappeared in from three to four weeks, except for pigmentation, and in chronic cases in from four to six weeks. In one case, lichen obtusus lesions on the legs cleared up after irradiation of the inferior field. Versari [26] treated two patients with lichen planus of the upper extremities and neck according to the Strasbourg technic. The pruritus subsided in two days in one case and in ten days in the other, and in each instance the eruption had disappeared at the end of four weeks. Montpellier and Zeraffa [27] omitted irradiation of the right lumbosacral area in the treatment of a patient with acute general-

26. Versari: Zentralbl. f. Haut- u. Geschlechtskr. **17**:439, 1925.

27. Montpellier and Zerraffa: Bull. Soc. franç. de dermat. et de syph. **32**: 185, 1925.

ized lichen planus by the Strasbourg technic. The pruritus disappeared in two days, except for that on the right leg, which remained for two months, at which time all manifestations of the disease had disappeared. Nahan [28] reported good results in generalized lichen planus by treatment of the superior sympathetic field in heavy dosage (10 Holzknecht units) with the Gouin method, but stated that results were less favorable when the eruption involved the lower half of the body even though the lumbosacral area was similarly treated. Schoenhof [29] demonstrated two cases of generalized lichen planus, one of which showed verrucose lesions on the legs. With Pautrier's technic one case cleared up in six weeks and the one with verrucose lesions showed healing of the eruption on the lower extremities and trunk but persistence of the eruption elsewhere. Nijkerk,[30] employing the Gouin technic, reported complete recovery without other treatment in three cases of generalized lichen planus, considerable improvement in two cases of localized character and aggravation of the disorder in several cases. By the fractional dosage previously referred to, Nijkerk [22] obtained excellent results in eight cases, with recovery in one or two months, on an average. Neumark and Krynski,[21] reporting on eight cases, stated that good results followed treatment only in those in which the eruption was generalized. They reported that three patients recovered, three improved and two were uninfluenced by treatment. They irradiated some areas of the spine three times at intervals of four weeks. Jeanselme and Burnier,[31] reporting on the effect of treatment in fourteen cases, observed prompt relief of pruritus in three generalized and three localized cases, disappearance of the lesions in one generalized and two localized cases and marked improvement in one generalized case. No results followed treatment in one generalized case, and in two of verrucose, two of buccal and one of vulvar lichen planus. Treatment of the cervical region in two cases of lingual eruption also failed. The Gouin method was used. Rosenthal [32] treated seven patients with acute and subacute generalized lichen planus, in three of whom the pruritus disappeared in a week and the eruption in from five to six weeks. Three of the cases responded slowly and required two or three treatments before beneficial action was obtained. In one case the itching was intensified, and in a case that showed only buccal lesions there was no apparent influence. In the generalized cases with lesions of the mucous membrane, the latter were also observed to involute. Nicolau and Stefanescou [33] used

28. Nahan: Zentralbl. f. Haut- u. Geschlechtskr. **19**:230, 1926.
29. Schoenhof: Zentralbl. f. Haut- u. Geschlechtskr. **21**:132, 1927.
30. Nijkerk: Zentralbl. f. Haut- u. Geschlechtskr. **23**:768, 1927.
31. Jeanselme and Burnier: Zentralbl. f. Haut- u. Geschlechtskr. **25**:407, 1928.
32. Rosenthal: Dermat. Wchnschr. **91**:1033, 1930.
33. Nicolau and Stephanescou: Dermat. Wchnschr. **91**:1212, 1930.

the Pautrier method in two zoniforme cases, with recovery in one and failure in the other, and the Gouin method in one zoniforme and five generalized cases, with recovery in two, improvement in one and failure in three. They also treated five patients with generalized lichen planus by peripheral irradiation of the sympathetic fields of the axillae and iliofemoral areas with recovery in four; they therefore concluded that the last method was the treatment of choice. Of the spinal methods they preferred the Gouin type. Most of these patients received single treatments only. One hundred and seventy-seven reported cases were summarized by these investigators. One hundred of these patients had been irradiated by the radicular technic and seventy-seven by the spinal sympathetic technic. The result in the first group showed recovery in sixty-nine, improvement in ten and failure in twenty-one. The second group showed recovery in fifty-eight, improvement in eight and failure in eleven. Driver [23] treated seventeen patients and reported twelve favorably influenced, ten of whom were regarded as completely cured. Seven of these patients were treated by the unfiltered method, six by the filtered method and four by both technics. Driver observed that the acute generalized cases responded best, that in the chronic generalized cases the results were uncertain and that in cases with lesions of the mucous membranes the treatment failed. Good results followed the treatment of acute and subacute localized hypertrophic lesions of the extremities. Driver concluded that this form of therapy is of proved value in the treatment for lichen planus, and he stated that the filtered irradiations yielded the best results. Huet [34] recently reported the prompt healing of buccal and lingual lesions in a case following spinal irradiation. Rosti [35] treated thirteen patients by the Gouin technic, and observed prompt relief of pruritus and slow involution of the lesions. Herxheimer [36] reported twelve unusually resistant cases in which irradiation of the spinal sympathetics was successful. Mueller, Pellizza, Hermann, Samek, Dewing, Miorcei and Brouard reported favorable results with the latter method.

During the last three years I have treated thirty-three patients with lichen planus by roentgen irradiation of the spinal region, and I selected only those cases in which this form of treatment appeared to be the preferable one. In favor of this method are its simplicity as compared with direct irradiation in cases of widespread eruptions, the inconvenience attending frequent treatments of certain patients in the office and the failure of other measures previously employed in individual cases.

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34. Huet: Bull. Soc. franç. de dermat. et de syph. **37**:292, 1930.
35. Rosti: Zentralbl. f. Haut- u. Geschlechtskr. **33**:452, 1930.
36. Herxheimer: Zentralbl. f. Haut- u. Geschlechtskr. **33**:452, 1930.

These thirty-three cases included twenty-five patients with acute or subacute generalized lichen planus in which generalization had been present for from two to twelve weeks and was still progressing in most instances, and eight patients with chronic generalized lichen planus showing pronounced activity or acute exacerbations. The first group showed the typical diffuse eruption of discrete small papular lesions in all cases, and twelve of them also showed hypertrophic annular and discoid lesions or large infiltrated plaques. Many of these patients had localized manifestations of lichen planus of variable duration preceding the time of generalization. Six of the eight chronic cases presented the hypertrophic type of eruption. Eleven acute and four chronic cases showed involvement of the buccal or lingual mucosa. Fourteen patients had subjective neurologic symptoms or gave indications of them in their histories, and in all but eight cases there were complaints of pronounced, often intense, pruritus. Transitory subsidence of pruritus was repeatedly observed to occur in a day or two, only to return, and may have been due to psychologic factors. Definite progressive and permanent relief of the pruritus occurred, however, and was in many cases coincident with beginning involution of the lesions. Beginning involution was usually observed within one, two or three weeks following treatment, and in most cases it continued without interruption. Nine cases showed temporary intensification of the pruritus and inflammation occurring in a day or within the first two weeks. This so-called Herxheimer reaction was pronounced in only two cases, and most patients did not observe untoward symptoms following irradiations.

In twelve of the acute and two of the chronic cases there was prompt recovery, complete healing having occurred, except for a few scattered indolent lesions, in from three to twelve weeks following roentgen treatment. Four of these fourteen cases showed residual active patches on the legs, which disappeared without further treatment in two cases and followed the direct use of x-rays in the other two. In one other generalized case of twelve weeks' duration, there was recovery eighteen weeks after a single treatment. Of the remaining cases four showed improvement, and in eight cases (five acute or subacute and three chronic) no beneficial effects were observed that could be attributed to the irradiation. Four of the latter cases are still under observation. Six patients did not return or report following initial treatments. Several of the patients received small doses of mercury protiodide for short periods of time, and lotions were prescribed in some instances. Bromides and injections of mercuric salicylarsenate were given in several cases recorded as failures. Eleven of the fifteen patients who recovered had received a single treatment of the spinal sympathetic fields; three patients were treated twice and one patient four times. Of the patients whose cases

were recorded as failures three received one treatment each, four received two treatments and one was irradiated five times.

I considered spinal roentgenotherapy to have been definitely successful and responsible for recovery in fifteen of the twenty-seven cases that remained under observation, and to have been a factor in the improvement shown in five of the remaining thirteen cases. I believe that lichen planus may at times be cleared up as rapidly by other means, and that occasionally spontaneous regressions take place, but I am convinced that the Gouin or Pautrier treatment has a definite field of usefulness in the management of this disease, and that it may be indicated as the treatment of choice in extensive acute or subacute cases. I offer the suggestion that a combination of spinal irradiation and injections or medication may yield even better results.

CASE 1.—A housewife, aged 52, who had been subject to repeated nervous upsets, was seen on Aug. 12, 1930, because of a pruritic generalized eruption of three months' duration that had been unresponsive to local applications. The eruption had first appeared on the breasts and had extended over the anterior portion of the chest, abdomen, thighs, back, buttocks and upper extremities. The buccal mucosa was also involved. The lesions were acutely inflammatory, flat-topped and angular papules many of which had fused to form large infiltrated violaceous plaques, particularly on the hips, thighs and back. On August 22, the upper dorsal and the dorsolumbar fields were both irradiated with one-half erythema dose of x-rays filtered through 3 mm. of aluminum. Four days later there was relief from the pruritus and a subsidence of acute inflammation. Five weeks later, without additional treatment, no active lesions remained and most of the previously involved sites were hyperpigmented. The pruritus, which had been severe, did not recur after the fourth day and there have been no further manifestations of the disease.

CASE 2.—A machine operator, aged 20, was seen on July 23, 1929, because of an intensely pruritic eruption which had first appeared on the legs three months previously and had been generalized for two months. He had applied various local applications without benefit. A widespread profuse eruption of discrete violaceous papules of lichen planus was seen on the upper and lower extremities, abdomen, back, flanks and genitalia. The head, neck and oral mucous membranes were not involved. The upper dorsal spinal field was irradiated with the technic and dosage previously indicated. Four days later the same dose was applied to the dorsolumbar field. Eighteen days after the first treatment the lesions were flatter and less inflammatory, and there was no itching except when the patient was perspiring. Two weeks later itching had ceased entirely, and the lesions were flat and brownish-red or brown. A second spinal treatment was directed at each field, and five weeks later a fractional dose of unfiltered x-rays was applied to the anterior tibial surfaces, the only sites of residual lesions. No medication had been prescribed. There has been no recurrence.

CASE 3.—A housewife, aged 55, was seen on Nov. 6, 1930, because of a generalized intensely pruritic eruption of two months' duration. At the time of onset of the eruption she had been fatigued from a strenuous European trip. The first lesions appeared on the neck, flexor surfaces of the wrists and backs of the hands. Following this, various areas subject to friction from clothing became

involved. Examination showed a typical diffuse eruption of acute generalized lichen planus involving all cutaneous areas except the head, and also involving the tongue and buccal mucosa. Treatment was directed at the interscapular and dorsolumbar fields. Fifteen days later there was a marked decrease of itching and most of the lesions were flattened and brownish. There were a few new lesions on the anterior portion of the thighs. Six weeks following the treatment the patient had recovered entirely from all active evidences of lichen planus. There has been no recurrence.

CASE 4.—A man, aged 67, a teacher, was seen on Feb. 28, 1930, because of an extensive and intensely pruritic eruption of five weeks' duration. He had been subject to extreme nervousness after being in a street car accident several years before. He presented a generalized eruption of acute lichen planus, most pronounced on the abdomen and thighs but involving other areas of the trunk and upper extremities. Treatment was directed to each spinal sympathetic field. Three weeks later the pruritus had ceased and the eruption had disappeared. A lotion had been prescribed, but no other treatment was employed. The patient has remained well.

ECZEMA, NEURODERMATITIS AND PRURITUS

The first reference to spinal irradiation in the German literature appears to be the report of Kriser [37] on the treatment by this method of fifty patients with neurodermatitis, eczema, generalized pruritus and psoriasis. Twelve patients with psoriasis were treated without effect; in the other disorders definite success was attained in the alleviation of pruritus and in the reduction of the objective inflammatory manifestations of the eruptions. Schoenhof reported subsidence of pruritus and reduction of lichenification in five of thirteen cases of neurodermatitis, and recovery in several cases of scrotal and vulvar pruritus and pruritus senilis. He observed little or no influence in cases of chronic urticaria and psoriasis. I likewise treated several patients with psoriasis without effect. Kreibich [11] subsequently reported on fifty patients with this group of disorders treated in his clinic by Schoenhof with the Bordier technic at intervals of two weeks for two or three treatments. These had received no treatment for some time prior to the irradiation and were chosen for this procedure because of the widespread character of their eruptions and because of genital localization. He observed prompt decrease of pruritus and, as a consequence a reduction of the objective inflammatory manifestations, though recurrences were not prevented. He reported favorable results from this treatment in eight cases of chronic eczema and neurodermatitis. Samberger [38] observed a reduction of pruritus in from ten to fourteen days following radicular roentgenotherapy in chronic neurodermatitis, and in most cases following the second treatment the characteristic lichenification began to subside and the hyperkeratotic layer became thinner or scaled off. The

37. Kriser: Wien. med. Wchnschr. **75**:1429, 1925.
38. Samberger: Dermat. Wchnschr. **85**:963, 1927.

other characteristics of the dermatoses remained and required local treatment. Valentova [39] observed a disappearance of hyperkeratosis, reduction of lichenification and cessation of pruritus in some cases of chronic neurodermatitis, lichen planus and extensive lichenified eczema following radicular therapy. Pruritus usually subsided in two weeks, and the objective manifestations of the disease disappeared after several treatments. Following irradiation of the spinal sympathetic field in acute and chronic eczema and in generalized pruritus without lesions, Maderna [40] noted a favorable influence on the pruritus. This was often preceded by a temporary intensification of the symptoms.

In my series of cases of this group, two patients with generalized chronic neurodermatitis, nine with generalized chronic lichenified eczema and two with extensive papulovesicular eczema—all of whom had been unresponsive to a wide range of therapeutic measures—were treated by spinal irradiation. One case of neurodermatitis and four cases of chronic lichenified eczema showed considerable improvement; in eight cases there was no evidence of improvement. In the cases reported as showing improvement there was a prompt reduction of pruritus and associated with it a moderate or considerable reduction in the objective inflammatory manifestations. Since many of the clinical indications in cases of this type are the consequence of scratching, any measure resulting in the relief or reduction of pruritus should be considered valuable. Unfortunately, in most of these cases the response has not been permanent, but it has sufficed to give other treatment an opportunity to act more effectively and this has led to a satisfactory clinical improvement in a number of instances.

CASE 5.—A school girl, aged 17, when examined on Oct. 19, 1929, presented an acute exacerbation of a chronic papular and lichenoid eczematized dermatitis involving the face, neck, shoulders and flexural surfaces of the extremities. She had been under my care at intervals for the previous two years, the disease having been continuously present in variable severity since the age of 12. The history was unimportant except for spells of extreme nervousness; there had been no asthma or hay-fever. The family history was irrelevant. Systemic and local treatment had improved her condition, but because of an exacerbation spinal irradiation of the principal sympathetic field was given on Oct. 19, 1929. Previously instituted internal and local medication was continued. Four weeks later much subjective and objective improvement was noted, and a second spinal roentgen treatment was given. Shortly after a third similar treatment given in January, 1930, her skin and general condition appeared much improved and remained so for a year. In January, 1931, a mild papular dermatitis of the face developed, and the skin elsewhere was dry and harsh but showed no eczematization.

CASE 6.—A man, aged 37, a foreman in a factory, was seen on Aug. 9, 1929, because of a generalized dermatitis of ten years' duration that had developed

39. Valentova: Zentralbl. f. Haut- u. Geschlechtskr. **29**:646, 1929.
40. Maderna: Zentralbl. f. Haut- u. Geschlechtskr. **30**:49, 1929.

following a neglected furunculosis. He exhibited a generalized chronic lichenified dermatitis with secondary exudation, crusting, pustulation and adenitis. There was a severe universal hyperhidrosis. On Oct. 22, at which time the eruption was still active, he was given a roentgen treatment to the principal sympathetic field (one-half erythema dose with a 3 mm. aluminum filter). This was followed by a slight reduction of the pruritus and hyperhidrosis. On Jan. 20, 1931, the dermatitis being still severe, in spite of continuous treatment for a year with direct x-rays, baths, local applications, diet and internal medication, a second roentgen treatment was directed to the interscapular and the dorsolumbar fields. The patient reported that two days following the treatment the generalized hyperhidrosis had stopped and the pruritus had been greatly relieved. A week later there was considerable objective improvement and this was still more pronounced on February 15, at which time there was no pruritus, except over the legs, and no hyperhidrosis, and the lesions on the trunk had almost completely involuted. There was considerable reduction of the inflammation and infiltration on the neck and upper extremities, and the only remaining areas of inflammation, exudation and excoriation were on the legs.

In seven cases of anal pruritus, one of vulvar pruritus and one of scrotal pruritus, roentgen treatment was directed to the lumbosacral zone Most of these were of five to fifteen years' standing and had resisted various types of treatment, including the local use of x-rays. Four of these patients obtained a moderate amount of relief from the pruritus, in two instances within a day of treatment, and while none of them became entirely free from symptoms the pruritus did not show its original intensity. I do not believe that this method of treatment is as satisfactory as direct local roentgenotherapy, but in cases in which direct treatment is contraindicated or has been unsuccessful, it should be given consideration.

DERMATITIS HERPETIFORMIS

Roentgen irradiation of the spinal region has been successfully employed in some cases of Duhring's disease. In 1916 Lier [41] treated a patient with severe Duhring's disease by direct irradiation. After he had administered 3 Holzknecht units to several areas of the back, great improvement occurred. Subsequently he observed that all the lesions had disappeared, including those in several areas that had inadvertently been missed in the irradiation. Although he commented on this observation, he did not associate the result with irradiation of the spinal region. In 1928, Maderna [42] reported the complete cessation of pruritus and involution of the eruption in two cases of dermatitis herpetiformis after irradiation of the spinal region. The results followed single roentgen treatments in the absence of other therapy, and a beneficial effect was observed within four days following treatment. In 1929 Krynski [43] published a report concerning two severe cases of

41. Lier: Arch. f. Dermat. u. Syph. **123**:506, 1916.
42. Maderna: Zentralbl. f. Haut- u. Geschlechtskr. **27**:779, 1928.
43. Krynski: Dermat. Wchnschr. **89**:1480, 1929.

dermatitis herpetiformis of several years' duration that had proved refractory to all other measures. In the first case, each of two roentgen treatments was followed by subjective and objective improvement of a temporary character, but complete healing did not take place until six months after the first treatment, by which time the patient had been given five roentgen treatments. A series of injections of neoarsphenamine had also been administered. The second patient was intolerant to arsenicals and was treated with roentgen rays only. Two or three days after each of the first two treatments a reaction occurred in the form of an exacerbation of the pruritus and the eruption. This continued from one to two and one-half weeks, after which progressive improvement took place with a complete clinical recovery one month after the third treatment. Recently [44] these patients were reported as having remained completely free from manifestations of the disease for three and one-half and two and one-half years, respectively.

My series comprises twenty-two cases of dermatitis herpetiformis, all of which were generalized and the majority of which showed intense exacerbations of the disease. In quiescent cases and in those showing only small areas of involvement spinal roentgenotherapy was not given. Four patients did not return for observation, and of the others six showed no response to the treatment, five were moderately improved, five were much benefited and two had recovered. When last heard from, one of the last two patients had been well for five months and the other had had no manifestations of the disease for eighteen months, except for the occasional appearance of a few moderately inflammatory pruritic lesions on the elbows for one year. During the last six months he had been entirely well. Of the six patients who were not improved, none received more than two treatments, and one of these had a severe bullous type of eruption. None of the twelve patients recorded as improved showed a severe exacerbation after the first spinal irradiation, and none of this latter group received arsenical or other medication except at some previous time. The histories show that eleven patients had previously received potassium arsenite over variable periods of time, and one patient had pronounced generalized pigmentation and well advanced palmar and plantar keratoses. Thirteen cases were of four or more years' duration.

Observation of these patients indicates that the treatment has been of value in at least half of their number and that two of them have recovered. It is difficult to evaluate therapeutic effects in a disease characterized by spontaneous remissions, and some of these apparent successes may be misleading. I would express it as my opinion that roentgen irradiation of the spinal region in Duhring's disease is often

44. Neumark and Krynski: Strahlentherapie **38**:730, 1930.

followed by a definite beneficial effect on the subjective and objective manifestations; if this action is only ameliorative, it may still be considered of value and may possibly render this disease more amenable to control by other therapeutic measures.

CASE 7.—A physician, aged 71, who had been treated for dermatitis herpetiformis at different times during twenty-three years, showed a severe exacerbation in June, 1929. This did not yield to treatment, and spinal roentgen therapy was therefore given, on August 6, to the principal sympathetic field. Nine days later the eruption was seen to be subsiding and the pruritus was less intense; this improvement continued until, four weeks after the treatment, there was no remaining activity of the disease. A second treatment was given at that time. Though no exacerbations occurred, the subsequent development of a few lesions on the forearms prompted the giving of two additional treatments. During the following twelve months the patient had only occasional mild manifestations confined to the extensor surfaces of the elbows. He has been entirely well for six months. He is convinced that spinal roentgen treatment has been the most effective therapeutic measure employed in his case.

CASE 8.—A laborer, aged 53, was first seen in December, 1929, because of a generalized typical eruption of dermatitis herpetiformis of ten years' duration, characterized by only few remissions. At the time of examination the process was a severely inflammatory papulovesicular eruption distributed over approximately half of the cutaneous surface and showing greatest intensity on the extensor and lateral surfaces of the upper and lower extremities, buttocks, hips and scapular regions. He was given a roentgen treatment to the principal spinal sympathetic field, and ten days later the eruption and pruritus had almost disappeared. Eighteen days after the first treatment there was a slight flare-up with severe pruritus, and a second roentgen treatment was given. Two weeks after the second treatment the eruption had subsided; in another week only a few lesions remained and there was little pruritus. Five months after the second treatment the patient was still apparently well.

SCLERODERMA

In pharmacodynamic researches Salkan [45] observed a relationship betweeen scleroderma and the sympathetic nervous system. Hoffmann [46] made similar observations, but stated that it was not determined whether the sympathetic nervous system was primarily involved in scleroderma or only secondarily through endocrine dysfunction.

In 1929, Schoenhof [47] reported the successful treatment of a patient with scleroderma, by spinal roentgen irradiation of the dorsal and lumbar regions. This case was of four years' duration and showed extensive broad bands of sclerodermatous infiltrates and torpid ulcerations of two years' standing. It had resisted the usual therapeutic procedures. Following spinal treatment the ulcers healed and the

45. Salkan: Zentralbl. f. Haut- u. Geschlechtskr. **21**:299, 1927.
46. Hoffmann: Zentralbl. f. Haut- u. Geschlechtskr. **18**: 204, 1926.
47. Schoenhof: Dermat. Wchnschr. **90**:657, 1930.

infiltrates were absorbed. Schoenhof [48] subsequently reported nine cases of circumscribed scleroderma; in three of these complete disappearance of the cutaneous lesions took place, and in six marked improvement was observed following metameral or segmental irradiation of the spine. Schoenhof stated that he considered scleroderma to be a trophoneurosis.

In my series, five patients with circumscribed scleroderma received two or three treatments each, directed to the spinal sympathetic fields. One of these showed definite improvement in the condition within two months and complete absorption of the infiltrates seven months after treatment. Since no active manifestations were in evidence a year following treatment this case may be considered as one of complete recovery. Another patient showed definite improvement within the first four months after treatment; while still under observation and exhibiting some activity in the lesions, the patient may be considered as definitely benefited by the spinal irradiations. Two other patients showed definite, though less distinct, improvement following treatment; while new lesions or enlargement of the original ones have not developed, the disease is still active. One patient, in whom the disease was of twelve years' duration, failed to show improvement, although there was no extension of the disease.

These observations on spinal roentgenotherapy in circumscribed scleroderma are not in accord with the remarkable results reported by Schoenhof, but they are sufficiently encouraging to favor consideration of this method of treatment. It is possible that the use of more heavily filtered x-rays, as employed by Schoenhof, would yield better results.

CASE 9.—A housewife, aged 50, noticed a firm purplish-red patch in the right groin six months before consultation. This lesion had enlarged slowly and had become more solid to the touch. The history was otherwise unimportant. On April 23, 1929, there was a broad lardaceous infiltrate with violaceous borders in the right lower quadrant of the abdomen. Elsewhere on the lower portion of the abdomen, on the upper part of the buttocks, and in the lumbar and lower dorsal regions of the back there were infiltrated, dull purplish patches, from the size of a coin to that of a palm. The basal metabolism was plus 19. Examination otherwise gave negative results. The accessory sympathetic field in the dorsolumbar area was exposed to one-half erythema dose of x-rays filtered through 3 mm. of aluminum. Two weeks later the principal sympathetic field was similarly irradiated, and two months following the first treatment the dorsolumbar field received a second similar dose. At this time the lesions were softer, thinner and paler, and were definitely involuting. Seven months after the first treatment a third dose was administered to the inferior field. At this time there was no palpable infiltrate, and areas of previous involvement showed only slight atrophy and pigmentary changes. When the patient was last examined, approximately one year after the first spinal irradiation, the site of previous lesions could be determined only by slight atrophy, central depigmentation and peripheral

48. Schoenhof: Footnote 47; Zentralbl. f. Haut- u. Geschlechtskr. **33**:21, 1930.

hyperpigmentation. As no other treatment was employed and as the lesions had begun to involute within two months of the first treatment, this case is recorded as one of circumscribed scleroderma with recovery following spinal irradiation.

RAYNAUD'S DISEASE

In view of its symptomatology, Borak [49] was of the opinion that Raynaud's disease was a disease of spinal origin, possibly involving a hyperirritability of the vasomotor centers of the cord. He therefore undertook the treatment of patients with this disease by spinal irradiation, and in 1927 he reported on the treatment in eleven cases. He gave one-third unit skin dose (4 Holzknecht units or 200 primary R units) through 0.5 mm. of zinc, repeated three times at intervals of from four to eight weeks in resistant cases. Ten patients were definitely benefited. Four cases, of from one to ten years' duration, showed relief from paresthesias and pain, and healing of ulcers and fissures without local treatment. Only trophic changes in the bone and indurated lesions of the soft parts were uninfluenced, and the resistant case was sclerodermic. Borak [50] later reported that these patients remained well, and he added seven cases in which similar beneficial action followed irradiation. Monier-Vinard, Delhern and Beau [51] obtained good results from this treatment in seven cases of Raynaud's disease. They irradiated the cervicodorsal and dorsolumbar fields by the cross-fire method for a dose of 400 R units to each field, filtered through 5 mm. of aluminum and repeated three times at weekly intervals. Gouin [52] reported that two patients with Raynaud's disease successfully treated by his method remained well for three years after the treatment.

MAL PERFORANT

In 1929, Schoenhof [47] treated a patient with mal perforant in whom ulcers of one and two years' standing had been unresponsive to treatment. One ulcer healed in fourteen days following spinal roentgen treatment, and the other diminished greatly in size. Turano [53] obtained good results in four cases of mal perforant following two or three irradiations of the lumbar region at intervals of twenty days.

HERPES ZOSTER

No one familiar with the behavior of herpes zoster will have the temerity to advance any therapeutic procedure without due reservations.

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49. Borak: Wien. klin. Wchnschr. **40**:800, 1927.

50. Borak: Wien. med. Wchnschr. **1**:536, 1929.

51. Monier-Vinard, Delhern and Beau: Zentralbl. f. Haut- u. Geschlechtskr. **31**:467, 1929.

52. Gouin and Bienvenue (footnote 16); Gouin: Zentralbl. f. Haut- u. Geschlechtskr. **32**:203, 1929.

53. Turano: Zentralbl. f. Haut- u. Geschlechtskr. **33**:473, 1930.

The eruption being self-limited, and the associated pain being usually controlled by salicylates, the chief indications for spinal roentgen treatment appear to be the occasional instances of resistant posteruptive neuralgia, those of severe and extensive eruption, those of excessive pain during the eruptive stage, and some coming under observation so early that one may speculate on the possibility of exerting an abortive action through treatment. In all these instances, and particularly in the latter, one is likely to credit too much to treatment.

Except for the following report I have found no published records concerning spinal roentgenotherapy in this disease: Hadengue[54] obtained relief in five and twelve days, respectively, in two cases of zoster neuralgia that had resisted treatment for one and one-half and two months. He exposed the involved nerve root zones to a total of from 5 to 6 Holzknecht units given in fractional dosages of from 1 to 2 Holzknecht units daily through a filter of 4 or 5 mm. of aluminum.

For many years I used unfiltered x-rays, directed to the involved nerve roots, in the treatment for herpes zoster, but in this paper I shall consider only those patients treated with filtered irradiation during the last three years. In these, the regions of the cord and its roots concerned in the innervation of the affected cutaneous fields were exposed to one-half erythema dose. There were five cases of severe posteruptive neuralgia, six with active lesions and severe pain and five in which there were extensive cutaneous eruptions but pain was absent or a minor consideration. All of the first group of patients, with neuralgia of fourteen, twenty-five and thirty days, and fifteen and sixteen months' duration, respectively, were promptly relieved of pain, though two continued to have some discomfort. The patients in the second group, with lesions of from one to six days' duration and severe neuralgic pain preceding the eruption by two or three days, reported relief of pain in all but one instance, and in four cases healing of the lesions occurred within six days. In eight of the ten cases with eruption, desiccation of the lesions had taken place within six days of the treatment, and the longest period of activity of lesions did not exceed eleven days.

These observations suggest that the healing time of the zoster eruption may possibly be shortened and that the accompanying pain may be definitely relieved in the majority of cases by spinal irradiation.

COMPLICATIONS

Roentgenotherapy of the spinal region is associated with certain hazards and with occasional annoying manifestations and, more rarely, dangerous sequelae. The technical risks that accompany any form of

54. Hadengue: Zentralbl. f. Haut- u. Geschlechtskr. **19**:871, 1926.

roentgenotherapy must be noted, but will not be discussed in this paper. To this must be added the errors of judgment in determining the amount or frequency of irradiations in individual cases and the possibility of late sequelae, owing to cumulative dosage affecting the skin, the hematopoietic tissues of the irradiated spinal area, the small blood vessels of the cord and its coverings and the nerve tissues.

Hudelo, Laporte and Kourilsky [55] reported a case in a patient with acute generalized lichen planus who was given two treatments at intervals of three weeks with a dosage at each sitting of 3 Holzknecht units, through a 10 mm. aluminum filter and with a 10 inch (25 cm.) spark gap setting. The x-rays were directed from three sides to both the dorsal and the lumbosacral fields. Four days after each treatment there was an intensification of pruritus and a generalized cutaneous congestion, associated in the second reaction with vesicular lesions, edema of the lower extremities and swelling of the axillary and inguinal lymph nodes. This condition continued for three weeks, at which time a pronounced exfoliation took place and many new lichen planus papules appeared. Two weeks later these various inflammatory manifestations began to decline and then disappeared. Gougerot and Filliol [56] reported a case of lichen planus confined to the buccal and lingual mucosa in which, six weeks after irradiation of the cervical and dorsal spine, a typical lichen planus eruption appeared in the irradiated skin and on the scrotum. The original lesions were uninfluenced. Maire and Woringer [57] reported extension of the lesions following cervical irradiation in a case of oral lichen planus. Gouin [58] irradiated the cervical region in a patient with buccal lichen planus and with pruriginous, urticaria-like cutaneous lesions. Following irradiation the latter lesions were replaced by a typical lichen planus eruption, but subsequently both the cutaneous and mucous lesions disappeared. Hufschmitt [59] reported the disappearance of a typical lichen planus eruption following radicular therapy associated with the simultaneous development of a radioresistant verrucose hypertrophic lichen on the legs, knees and wrists. Huffschmitt [60] also reported a case of generalized lichen planus that cleared up after radicular therapy in which a new eruption appeared two and one-half years later. The second eruption did not respond to similar treatment, and was associated with the appearance of lichen papules in the irradiated areas. He concluded, therefore, that roentgenotherapy

55. Hudelo, Laporte and Kourilsky: Bull. Soc. franç. de dermat. et de syph. **32**:6, 1925.

56. Gougerot and Filliol: Bull. Soc. franç. de dermat. et de syph. **33**:191, 1926.

57. Maire and Woringer: Bull. Soc. franç. de dermat. et de syph. **36**:480, 1929.

58. Gouin: Zentralbl. f. Haut- u. Geschlechtskr. **25**:198, 1928.

59. Hufschmitt: Bull. Soc. franç. de dermat. et de syph. **34**:254, 1927.

60. Hufschmitt: Zentralbl. f. Haut- u. Geschlechtskr. **25**:674, 1928.

did not give assurance against recurrence in lichen planus. Hudelo and Rabut [61] discontinued the Pautrier technic for the treatment of lichen planus in favor of the Gouin technic after observing that generalized erythroderma followed the former method. Cedercreutz [62] reported a case of lichen planus in which, shortly after roentgen treatment according to the Pautrier technic, an acute lichen planus eruption appeared in the irradiated fields. I made a similar observation in one of my cases, as did Nicolas and Rousset.[63]

CONCLUSIONS

A study of roentgen irradiation of the spinal region leads me to conclude that this form of therapy is the most satisfactory method of treating patients for acute or subacute generalized lichen planus, and that it is of considerable value in chronic generalized cases of this disease. When definite improvement is not observed after two treatments, I consider it advisable to employ other measures, either alone or in conjunction with additional spinal irradiation. In dermatitis herpetiformis considerable benefit and, in some instances, recovery may be expected from this method of treatment. It appears that in this disease repeated spinal treatments are required. The method is of definite value in some cases of scleroderma. In the management of chronic generalized eczema and neurodermatitis, spinal irradiation is useful. In the posteruptive neuralgia of herpes zoster this method of treatment is of distinct benefit, and it may shorten the course or the intensity of the zoster eruption.

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ABSTRACT OF DISCUSSION

Dr. James R. Driver, Cleveland: My interest in roentgenotherapy of the spine in the treatment for skin lesions dates back about five years, at which time I began the treatment of some patients with lichen planus according to the technics of Gouin and Pautrier. I was at first skeptical of the rather glowing reports of the French dermatologists.

Three years ago I reported a series of seventeen cases of lichen planus in which this new method was used. The results at that time led me to recommend the method in all cases of acute and subacute generalized lichen planus and in all other types of the disease that do not respond to other methods.

During the past three years I have treated twenty-seven additional patients with acute, subacute and chronic generalized lichen planus by spinal roentgenotherapy with essentially the same results that were obtained in the earlier series; i. e., the best results were obtained in the acute generalized cases, those in which the disease had not existed longer than eight weeks. In the subacute and chronic

61. Hudelo and Rabut: Zentralbl. f. Haut- u. Geschlechtskr. **25**:408, 1928.

62. Cedercreutz: Urol. & Cutan. Rev. **32**:10, 1928.

63. Nicolas and Rousset: Bull. Soc. franç. de dermat. et de syph. **36**:506, 1929.

cases the beneficial effects of spinal irradiation were not so striking, but following or accompanying this therapy the administration of mercury or local irradiation of the lesions similarly was more effective than in those patients who had not received spinal irradiation.

A study of the literature I think now shows that most investigators are agreed as to the established value of this treatment so far as lichen planus is concerned.

I am glad that Dr. Foerster has made this serious investigation of spinal roentgenotherapy, not only in lichen planus but in other dermatologic conditions that are unusually resistant to all therapy.

I feel that American dermatologists have not given the subject the serious consideration that it deserves. Early failures or exacerbation of symptoms have led many to discard the method as valueless. I believe, however, that a thorough trial will convince many of those who are still skeptical of its value in lichen planus.

As regards other dermatoses, my own experience is much more limited than that of Dr. Foerster. One case of circumscribed scleroderma in a woman was markedly improved following this treatment; the disease was arrested and the infiltrates were almost completely absorbed. I have not had an opportunity to observe this patient for over one year.

A man with extensive severe dermatitis herpetiformis received three roentgen treatments (1/250 unfiltered each) directed to the local lesions, chiefly over the back, ten years ago. The lesions and symptoms disappeared in about six weeks. He has remained well to date. Whether spinal irradiation was responsible is, of course, impossible to say.

It has been my custom to treat patients with herpes zoster by spinal irradiation, and I believe that the relief from pain and discomfort has been more prompt in the majority of those thus treated.

DR. JEFFREY C. MICHAEL, Houston, Texas: I believe that this method is a purely empiric one. The explanations of its mode of action are not satisfactory. In the first place, the etiology of lichen planus is unknown — if we exclude the type that seems to occur from arsenical medication. Secondly, we do not know what this treatment does in itself. As it is empiric, we must collect a large number of cases in which its effects have been competently observed; then the method can be evaluated properly.

My own experience with it is decidedly limited. I would not mention it, except that so often physicians will give a proposed method a trial in a few cases and, obtaining no results, will never mention their experience. The picture shows only high lights and no shadows.

I treated nine cases of acute or subacute lichen planus by spinal roentgenotherapy, using the filtered technic of Driver, and in none of these cases did I see a result that was not compatible with the natural course of the disease. However, I am not entirely pessimistic for the series is so small that the next nine cases may entirely change the situation.

In one of my cases an unusual complication of the treatment mentioned in Dr. Foerster's paper occurred. A patient with a subacute lichen planus chiefly confined to the forearms, was given a single treatment to the interscapular area by the method already mentioned. Acute lichen planus developed on this area. The slide (presenting lantern slide) shows the definite limitation of this eruption. A biopsy was not obtainable, but I do not believe that any doubt about the character of the outbreak need exist. The eruption in this area disappeared in about two months, while that on the forearms, despite mercury, continued and has now become hypertrophic and verrucose.

Dr. George M. MacKee, New York: I have not had as much experience with this method as Dr. Foerster has. He has given the method a very serious trial; I have not, but I have had some experience and, roughly speaking, my experience conforms to that of Dr. Foerster. My results have not been quite so good. It is possible that my next series of cases will give better results. My experience has been chiefly with lichen planus. Recently I have been following the technic of medical diathermy advocated by Dr. Pardo, applying medical diathermy to the upper part of the spine. Thus far, the results have been better than with spinal roentgenotherapy. I have not had the complication mentioned by Dr. Michael, but it is seen in almost any acute dermatitis; lichen planus, eczema, psoriasis and a number of different diseases may be complicated in this manner with a dose that would not cause erythema in a normal person. I have had several cases of scleroderma that have improved. No case has cleared up, nor have I been able to cure a case of dermatitis herpetiformis.

On the whole, my results in lichen planus have not been nearly so constant with spinal irradiation as with the conventional methods. The method should be tried by a large number of dermatologists and the results reported, so that we may evaluate the method fairly.

Dr. Harry R. Foerster, Milwaukee: Dr. Driver's observations are of interest and value in that they indicate a quite constant percentage of recoveries following spinal roentgenotherapy in lichen planus. In his original paper he reported 59 per cent recoveries, and he has approximated that figure in the group of patients treated since that time. In my series of twenty-seven cases of lichen planus, 56 per cent are recorded as recovered. Nicolau and Stefanesco summarized 177 European cases of lichen planus; they recorded 69 per cent recoveries in one hundred patients treated by the radicular method and 75 per cent recoveries in seventy-seven patients treated by the spinal sympathetic technic. Dr. Driver referred to the employment of other therapeutic measures in conjunction with spinal therapy. We are using them now in some cases since we believe that spinal therapy has been sufficiently tested in lichen planus to permit that procedure.

Dr. Michael's observation of lichen planus appearing in the field of irradiation is an interesting one that has been recorded in the literature and of which we have observed one instance. In that case the patient had a generalized lichen planus, but developed an intensification of the eruption confined exactly to the areas of skin exposed to roentgen rays. This new eruption cleared up within a short time coincident with the involution of the other lesions. Dr. MacKee stated that he had observed this reaction in lichen planus and in other dermatoses, and we have made similar observations in the irradiation of the spinal fields, the thymus area and other sites. I do not believe that the possibility of this reaction occurring — and it is very infrequent — constitutes a contraindication to the therapy under consideration. There are a number of recorded cases of generalized lichen planus appearing following irradiation of the cervical spine in the presence of lichen planus confined to the mucous membranes. I consider that possibility a contraindication to the employment of spinal irradiation in localized eruptions, and have therefore not treated patients with localized eruptions in this manner.

I am in accord with the views expressed by Drs. MacKee and Michael that spinal roentgenotherapy is still on trial, but I am convinced that it has established itself in lichen planus and expect that it will find a prominent place among the therapeutic procedures employed for some of the other dermatoses discussed in this paper. To avoid the criticism referred to by Dr. Michael, that some cases may have undergone spontaneous improvement coincident with spinal treatment

rather than because of it, I have refrained from recording as instances of successful treatment those cases in which the involution of lesions was very slow or took place some months after spinal roentgenotherapy. When subjective improvement has been observed within a day, or within a few days, and when distinct objective involution has occurred in lichen planus and in dermatitis herpetiformis within five days of spinal irradiation, it must be conceded that the treatment is the cause of the effect observed. This type of treatment may be considered empiric, since we do not know the exact etiology of the disease under consideration, but the presence of prominent neurologic features in lichen planus, dermatitis herpetiformis, zoster and certain eczemas admits of the consideration of a rational basis for the employment of spinal roentgenotherapy in those disorders.

THERAPEUTIC USES OF BACTERIOPHAGE IN THE PYODERMIAS

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Bacteriophage therapy has attained a place of prominence among the various methods used in combating human diseases. More impetus will be acquired by this form of therapy as we learn more about its action. It is an excellent therapeutic agent.

The history of the development of bacteriophage is so well known that a detailed repetition of this phase of this new science is unnecessary. Since Twort[1] first observed that his cultures of micrococci were attacked by a "disease," the science of bacteriophagy has made rapid progress, owing mainly to the untiring efforts and leadership of d'Herelle.[2] D'Herelle's efforts have been mainly directed toward the control of the diseases caused by the dysentery-colon-typhoid group of organisms. Gratia,[3] who interested himself with cocci, was the first to obtain a bacteriophage parasitizing on staphylococci. His bacteriophage is being used in many laboratories because of its lytic action for so many strains of staphylococci.

In pyogenic diseases of the skin Staphylococcus aureus is the most frequent invader. So far as streptococcic infections of the integument are concerned, we are not prepared to report any results, mainly because of the fact that we have not at our disposal a bacteriophage actively lytic for streptococci.

TECHNIC

When a patient presents himself for bacteriophage therapy, a culture is taken from the lesions to be treated. At the same time stock bacteriophage is adminis-

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* From the Department of Dermatology and the Department of Pathology and Bacteriology, New York Post-Graduate Medical School and Hospital.

* This work has been supported in part by a grant from the Josiah Macy, Jr., Foundation.

1. Twort, F. W.: An Investigation on the Nature of Ultramicroscopic Viruses, Lancet **2**:1241, 1915.

2. d'Herelle, F.: The Bacteriophage and Its Behavior, Baltimore, Williams & Wilkins Company, 1926.

3. Gratia, A.: Preliminary Report on a Staphylococcus Bacteriophage, Proc. Soc. Exper. Biol. & Med. **18**:217, 1921.

tered by swabbing the lesions, by injections into the lesions or subcutaneous injections at a distant site or by a combination of these methods. The method of giving bacteriophage is determined by the type of lesions to be treated.

The bacteria obtained from the lesions are identified in the laboratory, and their susceptibility to the stock bacteriophage ascertained. When the culture has completely lysed and has remained perfectly clear for twenty-four hours, the bacteriophage is considered satisfactory for use. In particular cases the potency of the phage is exalted by serial filtration of lysed cultures of the autogenous bacterial strain.

In recent months we have used a bacteriophage sent to us by Drs. Crutchfield and Stout. We find it of about the same potency as ours, by both clinical and laboratory tests. Both bacteriophages contain the Gratia polyvalent staphylococcic bacteriophage, with the addition of some other strains of bacteriophages obtained from various staphylococcic infections.

By the time the laboratory reports are ready, the patients have ordinarily received two treatments. If the laboratory reports are favorable, we continue, but if the infection is due to staphylococcus not fully susceptible to the phage, we advise some other form of therapy.

The details of the method of phage administration will be considered under the case reports.

REPORT OF CASES

This report is based on a study of 108 unselected cases of pyodermia. The table shows a list of the cases in which treatment was given, with the results.

Results of Treatment with Bacteriophage in One Hundred and Eight Unselected Cases of Pyodermia

Number	Patient	Diagnosis	Comment
1	F. G.	Carbuncle	Cured: follow-up one year; later: no recurrence
2	B. C.	Furunculosis	Treatment not completed
3	J. R.	Sycosis vulgaris	Improved
4	D. J.	Sycosis vulgaris	Improved; had several recurrences during year
5	H. W.	Sycosis vulgaris	Unimproved
6	D. W.	Furunculosis	Cured
7	J. K.	Sycosis vulgaris	Treatment not completed
8	M. G.	Furunculosis	Cured
9	M. G.	Furunculosis	Cured
10	B. G.	Acne vulgaris	Unimproved
11	W. G.	Sycosis vulgaris	Treatment not completed
12	N. E.	Sycosis vulgaris	Treatment not completed
13	P. R.	Carbuncle	Cured
14	J. S.	Sycosis vulgaris	Treatment not completed
15	S. B.	Sycosis vulgaris	Treatment not completed
16	L. M.	Furunculosis	Cured
17	D. M.	Furunculosis	Cured
18	W. R.	Sycosis vulgaris	Treatment not completed
19	G. L.	Furunculosis	Treatment not completed
20	A. S.	Sycosis vulgaris	Treatment not completed
21	A. D.	Furunculosis	Cured
22	A. H.	Furunculosis	Cured
23	C. D.	Furunculosis	Cured
24	A. K.	Sycosis vulgaris	Treatment not completed
25	L. B.	Sycosis vulgaris	Treatment not completed
26	J. T.	Furunculosis	Cured
27	M. M.	Sycosis vulgaris	Treatment not completed
28	M. G.	Acne vulgaris	Cured; several recurrences which were cured with bacteriophage; treatment discontinued and roentgenotherapy substituted
29	M. G.	Sycosis vulgaris	Worse
30	L. U.	Furunculosis	Cured
31	M. K.	Furunculosis	Cured
32	?	Folliculitis	Cured

Results of Treatment with Bacteriophage in One Hundred and Eight Unselected Cases of Pyodermia—Continued

Number	Patient	Diagnosis	Comment
33	J. M.	Furunculosis	Cured
		Infected cyst	Unimproved
34	H. T.	Furunculosis	Treatment not completed
35	T. K.	Sycosis vulgaris	Treatment not completed
36	E. S.	Furunculosis	Cured
37	H. B.	Furunculosis	Cured
38	F. T.	Sycosis vulgaris	Cured
39	E. T.	Stitch abscesses	Cured
40	P. C.	Furunculosis	Cured
41	M. R.	Furunculosis	Treatment not completed
42	S. W.	Furunculosis	Cured
43	H. S.	Furunculosis	Treatment not completed
44	I. F.	Abscess	Treatment not completed
45	G. S.	Furunculosis	Treatment not completed
46	J. F.	Impetigo contagiosa	Cured
47	F. H.	Sycosis vulgaris	Cured
48	E. M.	Furunculosis	Cured
49	J. M.	Impetigo contagiosa	Treatment not completed
50	R. S.	Furunculosis	Cured
51	B. B.	Sycosis vulgaris	Treatment not completed
52	S. T.	Furunculosis	Cured
53	N. V.	Furunculosis	Cured
54	N. R.	Furunculosis	Cured
		Acne vulgaris	Unimproved
55	D. B.	Furunculosis	Treatment not completed
56	A. C.	Furunculosis	Cured
57	I. C.	Furunculosis	Cured
58	J. T.	Furunculosis	Cured
59	W. J.	Furunculosis	Cured
60	F. M.	Furunculosis	Cured
61	K. K.	Abscess	Cured
62	P. P.	Sycosis vulgaris	Unimproved
63	P. M.	Carbuncle	Cured
64	N. R.	Sycosis vulgaris	Treatment not completed
65	R. M.	Furunculosis	Cured
66	R. H.	Sycosis vulgaris	Treatment not completed
67	M. G.	Furunculosis	Cured
68	A. D.	Furunculosis	Cured
69	J. K.	Furunculosis	Treatment not completed
70	T. F.	Furunculosis	General reaction; a month later jaundice developed, and patient was admitted to the hospital; icterus developed independently from furunculosis and phage therapy
71	R. M.	Furunculosis	Cured
72	S. R.	Furunculosis	Cured
73	I. D.	Multiple subcutaneous abscesses with lymphangitis	Cured
74	J. M.	Paronychia	Cured
75	C. H.	Furunculosis	Cured
76	J. K.	Sycosis vulgaris	Improved
77	S. D.	Furunculosis	Cured
78	C. R.	Carbunculosis	Cured
79	.....	Paronychia	Cured
80	S. C.	Furunculosis	Cured
81	C. H.	Sycosis vulgaris	Treatment not completed
82	E. G.	Furunculosis	Cured
83	M. R.	Furunculosis	Cured
84	S. B.	Carbuncle	Cured
85	E. C.	Furunculosis	Treatment not completed
86	H. S.	Furunculosis	Treatment not completed
87	R. O.	Sycosis vulgaris	Unimproved
88	S. W.	Furunculosis	Cured
89	H. M.	Furunculosis	Cured
90	L. L.	Sycosis vulgaris	Unimproved
91	S. B.	Furunculosis	Treatment not completed
92	M. T.	Furunculosis	Cured
93	M. C.	Furunculosis	Cured
94	H. Z.	Furunculosis	Cured
95	Q. M.	Furunculosis	Cured
96	B. F.	Furunculosis	Improved
97	M. K.	Furunculosis	Cured
98	S. G.	Furunculosis	Treatment not completed
99	A. M.	Sycosis vulgaris	Improved
100	L. G.	Furunculosis	Cured
101	C.	Acne vulgaris	Temporary improvement
102	?	Furunculosis	Improved
103	?	Furunculosis	Improved
104	H.	Furunculosis	Treatment not completed
105	D.	Sycosis vulgaris	Temporary improvement
106	H. D.	Furunculosis	Treatment not completed
107	?	Acne vulgaris	Unimproved
108	F. R.	Sycosis vulgaris	Improved

Paronychia.—Two patients with paronychia were treated. One had the infection on the toe. This patient received ten injections of 2 cc. each, subcutaneously, and wet dressings of bacteriophage were also applied locally to the lesion. The patient was cured by this treatment.

The second patient had paronychia of one of the fingers. He was treated in a similar manner with the same good results.

Folliculitis.—A baby with folliculitis involving the greater portion of the scalp was treated with bacteriophage, with good results. The bacteriophage was swabbed all over the scalp, and none was injected. Twenty-four hours later the patient was practically cured, and a second treatment was given. The patient was not brought in again, and we feel certain that if the baby had needed further treatment, it would have been brought back to us.

Stitch Infections.—A patient had a keloid on the chest which was excised and the wound sewed with fine dermal suture. Two days later pus was present in every stitch hole. The entire wound was swabbed with a polyvalent staphylococcic bacteriophage, and a sterile dry dressing applied. The sutures remained in place. At the next visit there was no sign of pus, and the wound healed by primary intention in ordinary time.

Multiple Abscesses of the Hands.—The following case is an example of this disease:

I. D., a woman, aged 39, came to the clinic complaining of painful swelling of the fingers and hands. She had had this condition for five years, and with wet dressings and surgical incisions it would clear up. She had never remained entirely free from lesions for periods longer than three months.

Examination revealed numerous abscesses of the fingers and hands which were not very tender. Pus was aspirated from several of these, and on culture, colonies of Staphylococcus aureus were found, which were readily lysable by our polyvalent staphylococcus bacteriophage. She received four subcutaneous injections of 2 cc. each at forty-eight hour intervals, and 0.25 cc. of bacteriophage was injected into the lesions. Wet dressings of bacteriophage and saline solution were also used on the affected parts. In four days the pyodermia was almost entirely well, but treatment was continued for a total of two weeks. This patient has now been free from lesions for over four months.

The general physical examination showed the patient to be slightly obese, with moderate hypertension. The blood pressure was 180 systolic and 80 diastolic. The blood sugar was 0.118 mg. per hundred cubic centimeters, and the urinalysis was entirely negative both chemically and microscopically.

Impetigo Contagiosa.—Two patients with impetigo contagiosa were treated. One patient had received one injection of the bacteriophage when he discontinued his visits to the clinic for treatment. The ultimate result is unknown.

The other patient was treated over a period of one week. He received subcutaneously six injections of polyvalent staphylococcic bacteriophage of 1 cc. each, and at the same time bacteriophage was swabbed over the affected portions of the skin. After the second injection improvement was marked, and at the end of one week he was entirely well. No other topical applications were made.

Infected Sebaceous Cyst.—We report one case of this disease.

J. M., a man, aged 33, came to the clinic complaining of multiple furuncles on the back of the neck and an infected sebaceous cyst in the same location. He had been having lesions on the back of his neck for fifteen years. On examination, he had several furuncles, varying in size from that of a pea to that of a cherry. These were in different stages of evolution. Into each lesion was injected 0.25 cc. of bacteriophage, and 1 cc. of this same substance was injected subcutaneously into the arm. He received 30 injections, the interval between injections varying from twenty-four to forty-eight hours. This large quantity was given with the idea of immunizing the patient. To the time this paper was written, a period of five months, he had had no lesions, whereas before treatment he never remained free from them for periods longer than one month.

In spite of prolonged bacteriophage therapy the infected sebaceous cyst failed to respond. It was necessary to incise the skin and maintain drainage to cure this lesion.

Acne Vulgaris.—Five patients with acne vulgaris were treated. Not a single patient was improved by this form of treatment. The cases were all of the pustular type of acne. Two of the patients also presented cystic acne lesions, and although the cystic fluid became sterile after bacteriophage had been injected, the cysts failed to improve.

M. C., a man, aged 30, in apparently good health, came to the clinic seeking relief from a pustular eruption on the back of ten years' duration. A careful history revealed that he did not take iodides or bromides in any form.

The face, the back of the neck and the back were markedly scarred from previous lesions. On the back were many pustular and papulopustular lesions varying in size from that of a pinhead to that of a pea. Comedones were also evident. The skin of the back was quite oily.

This patient was treated by the injection, subcutaneously into the arm, of 2 cc. of bacteriophage at twenty-four hour intervals, for a total of eight injections. At the same time, the back was swabbed with bacteriophage, and he was allowed to put on his clothes only after the bacteriophage had dried. He was completely cured, but remained well for only six weeks.

On his return, we gave him twenty-two injections of bacteriophage of 1 cc. each, and again swabbed his back daily. Under this treatment the lesions disappeared, and he remained well for six weeks, when he had another recurrence. About three treatments as described were sufficient to cause the lesions to resolve. After he had had six recurrences the treatment was discontinued, and roentgen therapy instituted. Examination of the pus from some of these lesions revealed Staphylococcus aureus, which was completely lysable.

The other four patients with acne vulgaris whom we treated did not respond in the slightest to bacteriophage therapy. In one case, material

from a cystic lesion contained Staphylococcus aureus, which was completely lysed by our bacteriophage. After one treatment some of the pus examined was sterile. After a few days it again contained Staphylococcus aureus. These cystic lesions were not influenced in the least, although the cystic fluid became transparent and sterile.

Abscesses.—Of the two patients with abscesses in this series, one had an abscess of the thenar eminence. He received one treatment and then disappeared from the clinic. The other patient whose history follows came to the clinic regularly.

K. K., a woman, aged 26, came to the clinic complaining of a painful, swollen, fluctuating mass measuring about 2 by 5 inches (5 by 12.7 cm.), situated on the left side of the interscapular region. Pus was obtained with an aspirating needle from this region.

Bacteriophage was injected into and around the lesion at twenty-four intervals, in 2 cc. quantities for six days. At the end of this time the lesion was full of pus. She received two more injections of 1 cc. each into and around the lesion, and two injections of 1 cc. each subcutaneously into the arm. In seventeen days the site of the lesion was normal.

Two weeks later the patient had a similar but smaller abscess on the right side of the interscapular region, for which treatment was given in about the same way and which responded in about the same time as the first lesion.

Wet dressings of bacteriophage and saline solution were used constantly. A determination of the blood sugar was made in this case, and it was found to be within normal limits.

For a localized abscess, this form of treatment is the one of choice, because under the influence of a specific bacteriophage, thick purulent material becomes thin and flows easily through a pinpoint opening. This eliminates the necessity of a crucial incision. Bacteriophage therapy lessens scar formation, toxemia from absorption and pain.

Furunculosis.—Of the total of 108 cases in which treatment was given, 62 were cases of furunculosis. All the patients who continued treatment were cured. There were no failures. Fourteen of the patients failed to complete their course of treatment.

Acute solitary furuncular lesions ordinarily present no problems. A good many of the cases for which treatment was given were of this type. We found bacteriophage of special value in the treatment for recurrent and multiple furunculosis and in furuncles situated in such locations as in the nose, upper lip, etc. In these types, this agent in our opinion cannot be surpassed. Although we cannot prove unequivocally that bacteriophage confers immunity, we have reason to believe that this is so.

Wherever there is encapsulated pus, incision and drainage is the treatment of choice in the majority of cases. One notices that in solitary lesions this method is easily carried out, but in multiple recurrent lesions, more general methods need to be resorted to.

We have noted that when bacteriophage therapy is used in recurrent and multiple furunculosis, the existing furuncles become smaller and finally disappear, that the pus liquefies and is easily expressed through a needlepoint opening, that the pain subsides, that the toxemia is lessened, that if new lesions form while the patient is under treatment, they are apt to be small and to undergo involution quickly and that when lesions stop forming, a recurrence at a later date has not been observed.

We believe that if a patient presents more than one furuncle and gives a history of having had several lesions in the past, a series of from three to ten subcutaneous injections of 2 cc. each at daily intervals, coupled with wet dressings of bacteriophage, is the treatment of choice. Our experience leads us to believe that this is sufficient to cure the patient of existing lesions and to confer an immunity.

As an example of the method of managing a case of this kind, we quote the following history:

A. H., a man, aged 38, a tinsmith, had been suffering from recurrent and multiple furuncles for the past six years. He had many furuncular lesions scattered over both arms. A culture of the pus revealed pure Staphylococcus aureus, which was readily susceptible to our bacteriophage.

He received a total of twenty-three injections of phage at daily intervals. These were given into the arm in 1 cc. doses. Locally, the furuncles were given applications of wet dressings of bacteriophage and normal saline solution. One-fourth cubic centimeter of bacteriophage was injected into some of the larger lesions. This patient was entirely cured, and no recurrence was reported almost a year later.

Carbunculosis.—Our series contains only 5 cases of carbunculosis. All of the patients were cured by the administration of bacteriophage. Our experience has been such that we are convinced that bacteriophage therapy is the treatment of choice in carbunculosis. We prefer this method of treatment for the following reasons:

1. Bacteriophage is capable of liquefying pus, so that it is possible to drain the involved areas through a pinpoint opening which is invariably present when a patient comes for treatment.

2. Toxemia is reduced by bacteriophage.

3. Pain is reduced.

4. The patient is usually well enough to pursue his work.

5. Recovery is more prompt than when incision and drainage are resorted to.

6. Hospitalization and an operation with its attending dangers are avoided.

7. The cosmetic results are better.

A history of the most severe case follows:

C. R., a woman, aged 53, reported to the clinic complaining of two carbuncles on the back of the neck of seven days' duration. Her family history revealed that

one sister had died of diabetes. The past history was irrelevant. This patient did not know that she had diabetes until after the development of the carbuncle.

On examination, there was a carbuncle about the size of a fifty cent piece on the posterior portion of the neck. There were several small openings in the center of the lesion. A similar lesion was present just below this one.

Examination of the urine showed 3.5 per cent sugar and a 4+ reaction to the test for albumin. The blood sugar determination was 0.23 mg. per hundred cubic centimeters. The culture from the lesion revealed Staphylococcus aureus, which was completely lysed by the bacteriophage.

A physical examination by the department of medicine showed that the patient had the following conditions: diabetes mellitus, albuminuria, hypertension, myocardial degeneration, vulvar pruritus and obesity. The blood pressure was 170 systolic and 80 diastolic. The weight was 209 pounds (100 Kg.), and the pulse rate 100 per minute.

From the very start of the treatment until the lesions were entirely cured, a wet dressing of bacteriophage and saline solution was kept on the neck. Once a day a fresh dressing of bacteriophage was put on and kept wet by the patient at home with normal saline solution. Two cubic centimeters of phage was injected into the lesion daily for the first week, and 2 cc. was given subcutaneously into the arm every day. At the end of a week the entire right side of the neck was edematous and reddened, and the lesion appeared to be much larger. In spite of all of this there was no pain, little tenderness and no toxemia. Large quantities of sanguinopurulent material were expressed each day. From the seventh to the tenth days, 15 cc. of phage was injected into the lesion. The following day 18 cc. was injected. From the twelfth to the twentieth day smaller amounts of phage were injected, ranging from 7 to 1 cc. It took twenty days to cure this diabetic patient of a severe case of carbunculosis by this method without active treatment for the diabetes.

Sycosis Vulgaris.—It is a known fact that sycosis vulgaris is one of the most recalcitrant conditions for which a dermatologist is called to treat a patient. Whereas on superficial examination one would tend to belittle the good effects obtained by bacteriophage therapy, on close examination of each individual case, the results appear to be quite encouraging. In 28 cases there were only 7 patients that failed to improve under the particular technic used at our clinic. Fifteen of the patients have not completed treatment. Six patients have improved so markedly that they marvel at the results. This may well be emphasized, because most of these patients have had the disease for many years, and every treatment tried has failed to influence the condition beneficially. In the treatment for sycosis vulgaris, we advocate the conventional dermatologic methods first, and if these fail, bacteriophage therapy either alone or in combination with conventional dermatologic procedures. This adds another method to the armamentarium of the dermatologist.

The best result obtained is illustrated by the following history:

F. T., a man, a Negro, aged 52, had the disease for four years prior to the beginning of treatment with bacteriophage. He had been under treatment at various clinics and with several private physicians. He had used salves and lotions of

every description without improvement. He had also been treated with ultraviolet and roentgen rays with transient improvement. On examination, he presented a deep folliculitis involving the entire bearded region. In some places there were crusts. The skin of the face was quite edematous, with deep fissures in the corners of the mouth, the nasolabial junctions and on the chin. The submental and submaxillary glands were enlarged and tender.

A few hairs from infected follicles were epilated and cultured. Staphylococcus aureus was isolated, which was completely susceptible to bacteriophage.

The patient was treated every day for thirty days. Twenty-four hours after the first treatment, he was much improved, and five days later he was more than 50 per cent improved. He was completely well at the end of thirty days. The treatment consisted in the injection, subcutaneously, of 2 cc. of polyvalent staphylococcic bacteriophage into the arm. The patient was required to wash his face with soap and water three times a day. Bacteriophage was also swabbed daily over the affected areas.

In general it can be said that bacteriophage is a useful therapeutic agent. It is not a cure-all, and does not cure all patients treated even though the invading organism is strongly susceptible to the action of bacteriophage. The patients who respond to bacteriophage therapy are cured more rapidly, with less danger, with less pain and with the additional important factor of imparting immunity against the disease for which treatment is given. More prolonged observation is necessary to ascertain the duration of this immunity in our patients.

REACTIONS

In the cases studied no reactions were noted following the swabbing or application of wet dressings of bacteriophage on the lesions. In a few cases, two types of reactions were noted following the injection of bacteriophage subcutaneously at a site distant from the lesions. They were:

1 *a*. Local reaction at the site of injection. This consisted in redness, pain and edema at the point where the bacteriophage was administered. The involved area varied in size, depending on the severity of the reaction. Sometimes the entire arm became red, swollen and tender, and the reaction persisted for several days.

1 *b*. Local reaction at the site of the lesion. In a few instances, particularly in cases of multiple furunculosis, there was seen an increase in redness and swelling at the periphery of each lesion. Pain was absent. In other words, although the inflammatory process appeared to be more severe, the subjective symptoms were less. The reaction at the site of the lesion resulted, not from the application of bacteriophage to the lesion, but from the injection of bacteriophage into the arm, subcutaneously, away from the lesions.

2. Systemic reaction. In a few cases, a generalized systemic reaction followed the administration of bacteriophage subcutaneously.

This reaction consisted in increase in temperature, malaise and vomiting. In no case was there a generalized reaction without a local reaction at the site of the lesion. All lesions showed marked improvement after a reaction.

Another reaction is the one that follows the injection of bacteriophage in and around a lesion. Boardlike edema and redness about the lesion result. This change in character is frequently wrongly interpreted. At first it is thought to be an extension of the pyogenic process. Pain is conspicuous by its absence. Even tenderness is frequently absent. This type of reaction most often follows the first injections, and with subsequent injections the edema becomes lessened, the purulent element becomes less thick, and it flows out easily from a pinpoint opening. Cultures of this type of pus taken on several occasions proved to be sterile.

From our experience, it is easy to become enthusiastic about this new form of therapy in dermatology. Other writers on the subject have been even more enthusiastic than we.

All patients with furunculosis have been cured in less time, on the average, than when treated by other methods heretofore used. The cosmetic results have been excellent, and there has been immediate freedom from pain. Toxemia has not been noted in any case, regardless of its severity.

We can say the same of such treatment in carbunculosis. Freedom from pain, absence of toxemia and excellent cosmetic results have been outstanding features.

All the cases of sycosis vulgaris have shown marked improvement after one, two or three treatments. This improvement went on to a certain point in the majority of cases, but was not sustained.

One patient with impetigo contagiosa was cured; the other patient did not return to the clinic after the first visit.

Both patients with paronychia were cured.

In the patient with the stitch abscess, there was prompt involution of the infectious process after the affected area was swabbed with bacteriophage.

The cases of abscesses delivered frank yellowish-green pus through a needlepoint opening. Two abscesses in one case were completely cured without surgical intervention.

The patients with acne vulgaris (infected cystic type and deep pustular type) showed no improvement whatever. By injecting bacteriophage into the encapsulated lesions and culturing the contents twenty-four hours later, we found that we invariably obtained sterile cultures, whereas previous to the administration of bacteriophage, pure cultures of Staphylococcus aureus were obtained. If bacterio-

phage treatment was suspended for a short time, these same sterile lesions again yielded pure cultures of Staphylococcus aureus.

CONCLUSIONS

Bacteriophage is a valuable therapeutic agent in dermatology.

Most patients treated showed marked improvement very soon after the institution of treatment, but all those treated were not cured.

The therapeutic results in 108 cases of staphylococcic infections in which bacteriophage was used are reported.

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ABSTRACT OF DISCUSSION

Dr. Samuel Ayres, Jr., Los Angeles: I am much interested in Dr. Cipollaro's large series of cases in which bacteriophage treatment was given. We have been interested in the same subject for the last year and a half, and while we have not such a large series of cases, I can corroborate almost everything he has said.

One important point is to test the phage against the bacteria in the case proposed for treatment. I think it is of little value to use a stock phage without some preliminary testing. Another point of great importance is the lysing time. If the bacteria are lysed within an hour or two, the phage is much more potent and likely to produce lysis than a phage that does not cause lysis for six hours. It is possible by manipulations to get the lysing time down to from one to two hours or less, and I think this should always be attempted.

It is also important to make preliminary intradermal tests to determine whether the patient is sensitive to the proteins of the phage. I think the intradermal tests, with possibly 0.05 cc. of the phage being used and twenty minutes being allowed to elapse to be sure the patient is not sensitive to proteins is important.

I agree that the results in acne have not been as satisfactory as those in furunculosis. One excellent result was obtained in an acute pyoderma of the hand, with a lymphangitis extending up the arm into the axilla. A culture was taken, and Staphylococcus aureus was obtained. The patient was sent to the hospital and within twenty-four hours the phage was ready for use. At this time the arm was very uncomfortable; the mass was exceedingly tender and gave the impression that an abscess was about to develop. We injected 1 cc. of the phage subcutaneously along this area and another 1 cc. into the other arm. Within twenty-four hours the swelling had subsided and the lesion could be manipulated without pain. The patient left the hospital in forty-eight hours, practically cured.

I wish Dr. Cipollaro would say something about the use of bacteriophage as treatment in septicemia.

Dr. David Bloom, New York: In order to test the value of bacteriophage in staphylococcus infections of the skin, we have used it in our cases of sycosis at Dr. Fox's clinic at the New York University Medical College. From May, 1930, to January, 1931, we have treated six patients with sycosis barbae and one with a severe folliculitis of the pubic region. We were anxious to help these patients who had suffered from the disease for many years and had to give up their usual occupation because of their unesthetic appearance or loss of time in doctors' offices and clinics. Carried away by Dr. d'Herelle's report, we started this treatment with hope and enthusiasm.

With the help of our bacteriologist, Dr. Small, we tried to prepare an autogenous phage for the patients, but we succeeded only in the case of one patient and only on a second attempt. We used, therefore, a stock bacteriophage that we obtained at the Rockefeller Institute. This phage was tested on the staphylococcus cultures isolated from each case, and was found active on all the seven cultures. By passing the phage through many generations, it was possible to obtain such potency that one millionth of a cubic centimeter of the filtrate showed active bacteriophage. We also did not ignore the fact that these organisms may dissociate under artificial cultivation into so-called "rough" or "mixed" types, and since bacteriophage may act on one type and not on another, fresh pus was obtained at intervals from the lesions, and the entire procedure of preparing an active filtrate was repeated.

This bacteriophage we have administered every second day in from 1 to 4 cc. doses, subcutaneously, away from the affected skin. In two of our patients we have made injections also directly into the affected skin. Following these injections, a severe general reaction developed in some patients, consisting of pallor, profuse perspiration and a fainting sensation, and a few hours later the arm into which the injection was made became red, swollen and tender.

Unfortunately, the results of the bacteriophage treatment were disappointing. While most of the patients showed improvement after a few injections, their condition soon became worse. We found that by other simpler means we succeeded more than by the use of bacteriophage. In fact, the lesions in one of these patients with a severe folliculitis of the pubic region cleared up completely three months ago after a number of injections of a nonspecific milk preparation.

DR. JOSEPH J. ELLER, New York: I think that bacteriophage therapy will be a useful addition to the armamentarium of the dermatologist. I have had the pleasure of watching Dr. Cipollaro's work in our clinic, and think that he has given a fair description of his results. I agree that where we are to expect results a test must first be made for good and rapid lysis. I think that the best results are obtained in chronic furunculosis and carbunculosis. In the treatment for carbuncles and furuncules we obtain the best results by making subcutaneous injections around the lesions and elsewhere for systemic immunity.

I have had a few striking results in private practice in carbunculosis and furunculosis. One man with a large carbuncle on the back of his neck, almost as large as a lemon, had been treated for nine years with ordinary vaccines, incisions and drainage, and three weeks after daily injection of the bacteriophage around the lesion and other injections into the arm, he had a cessation of symptoms.

In another case in which the patient had had repeated eruptions of furunculosis for several months, daily injections of bacteriophage in doses of from 1 cc. to 2 cc. into the arm for ten days caused a remission for several months, with no recurrence to date.

DR. C. F. LEHMAN, San Antonio, Texas: The rapid disappearance of pain and the definite shortening of symptoms in the treatment for pyodermias put this method definitely in the forefront. The technical difficulties in the manufacture of the phage will probably prevent its wide use, but if one is fortunate enough to have the close cooperation of the laboratory, one will find distinct advantages, particularly in certain types in which we can demonstrate that lysis does not occur with polyvalent phages. This probably results in many failures, as was pointed out by Dr. Ayres.

Several precautions are necessary. First, do not use a contaminated preparation. They are easily contaminated. Second do not precipitate a sensitive state. I have had the experience of having had to treat two patients who were given

injections for chronic rhinitis, a severe sensitization dermatitis developed in both. After the patients recovered I found that they had been using ephedrine spray, and both were markedly sensitive to this drug.

I wish to know whether Dr. Cipollaro can give us any comparison between the length of time required for patients with furunculosis to get well when bacteriophage treatment was used and the length of time we would expect nature or something else to require to make them well. I think this is important in evaluating these preparations.

We are very enthusiastic about the method, and are fortunate in having Dr. Stout with us, for he is able to ensure the continued use of a potent product.

Dr. Marion B. Sulzberger, New York: Whether or not the results obtained with this treatment are what might be expected, the work certainly should be tried.

I have followed Dr. Cipollaro's work in the clinic, and in some cases the results have appeared to be remarkable. He was kind enough to place at my disposal a protein phage for two private patients with sycosis barbae. In both the treatment was ineffective.

There are some things we must bear in mind. First, the infections we are giving treatment for are to a degree self-limited. There is a tendency toward spontaneous healing, but it is difficult to predict when it will take place. Another point is that if the phage is not confined to a place distant from the lesion, the treatment is the same as that which we have been taught to consider best for bacteremia, opening and drainage. The third point is that the staphylococcus may be a secondary invader. These organisms are always present on the skin and are found in all pus by ordinary culture mediums. This requires special types of culture work in order to demonstrate other causative factors. A fourth point is that we have noticed that new types of therapy are always enthusiastically greeted, and somehow or other always meet with success. As they are used over a longer period that success seems to abate somewhat. If any one had watched Dr. Cipollaro work at the Post-Graduate Clinic, he would have had an explanation of why this might be. Every new boil was treated with the same care that a mother would give to a new-born babe. I think many of the old pyodermias would respond to this type of therapy. One type of case in which I have not had success is sycosis barbae, and I would welcome any treatment that would be successful in that condition.

Dr. Anthony C. Cipollaro, New York: In answer to Dr. Lehman's query, I wish to state that in one case of furunculosis in which there was one solitary acute lesion the patient was cured within twenty-four hours by injecting 0.25 cc. of bacteriophage into the lesion. No other form of therapy would do this so far as I know.

Dr. Bloom is of the opinion that furunculosis is easy to treat. I agree with him if he means an acute solitary furuncle. But if that lesion is on the upper lip or inside the nose, it is very serious to treat. Chronic recurrent and multiple furunculosis is often a difficult condition in which to obtain a cure. It is in these cases that bacteriophage is particularly valuable.

Dr. Sulzberger stated that most of the conditions that I gave treatment for were self-limiting diseases. This is true to a certain extent. Impetigo contagiosa, sycosis vulgaris, multiple recurrent furunculosis, etc., cannot be cured by the mere puncturing of the skin with a needle, because most of the patients who were treated had had injections of various materials without improvement.

Until we can get a bacteriophage manufactured on a commercial basis, bacteriophage therapy will be expensive.

Dr. Ayres spoke of a case of staphylococcemia in which cure was obtained with bacteriophage. I mention this because I desire to bring to the attention of the members of this section that bacteriophage has been used successfully in some cases of staphylococcemia and streptococcemia. In blood stream infections in which the organism is one that is susceptible to bacteriophage, this form of therapy deserves consideration.

We consider bacteriophage potent and satisfactory for use only if lysis occurs early, within the first two hours as Dr. Ayres mentioned, and is maintained for at least twenty-four hours.

CEPHALOSPORIOSIS

AN UNUSUAL MYCOTIC INFECTION *

HIRAM E. MILLER, M.D.
AND
HOWARD MORROW, M.D.
SAN FRANCISCO

A patient recently came under our observation with a gumma-like lesion involving the left side of the soft palate and the left tonsillar area. It was acute in onset, and within a short time caused a perforation of the soft palate. Its similarity to a syphilitic and a malignant lesion necessitated considerable pathologic study and the empiric use of arsphenamine intravenously even in the absence of a positive history or serologic indications. The ultimate isolation of a delicate mycelial organism resembling *Sporotrichum* gave the first information as to the possible cause of the disorder.

The culture and photomicrographs of the organism were shown to Dr. Fred D. Weidman. He tentatively classified it as a *Cephalosporium*. Further studies apparently confirmed this classification. The organism has been described in the recent foreign literature as a pathogenic agent in human lesions. We have been unable to find any mention of it in the American literature.

CASES IN THE LITERATURE

The entire mycological literature contains but five cases in which *Cephalosporium* was demonstrated to be the probable causative agent. Three occurred in patients with gumma-like lesions and two in patients with areas of superficial dermatitis. Three were reported from Germany, one from Madagascar and one from Italy.

In 1925, Grütz [1] of Kiel grew an *Acremonium*-like fungus from a hard, nodular swelling of three months' duration on the lower jaw and neck of a patient. He classified it temporarily as *Acremonium kiliense*. Later investigations placed it in the genus *Cephalosporium*. A painless hard swelling developed after the extraction of a tooth and was thought to be an actinomycosis, as the pus contained many granular elements. This was the first case in which *Cephalosporium* had been proved to be a pathogenic agent in human lesions.

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* From the Division of Dermatology, University of California Medical School.

1. Grütz, O.: Acremoniesis; A Case of an Unusual Mycosis, Dermat. Wchnschr. **80**:765 (May 30) 1925.

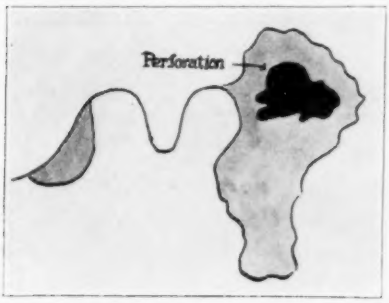

Fig. 1.—Gumma-like lesion with perforation from which cephalosporium was isolated.

Fig. 2.—Extensive scarring remaining nine months after the lesion had healed.

Fig. 3.—The organism isolated by Grütz.

In 1918, Boucher [2] grew a fungus from a nodular, gummatous lesion on the foot of a 30 year old native of Madagascar. He classified it as *Acremonium*, but later investigations proved it to be *Cephalosporium*.

In 1926, Hartmann [3] cultivated from a trichophytosis-like skin infection, besides *Trychophyton gypseum*, a fungus similar to the one

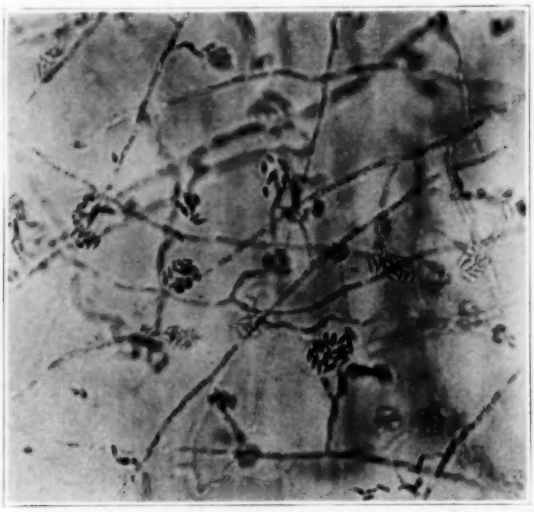

Fig. 4.—Cephalosporium isolated from our patient.

Fig. 5.—Cephalosporium culture five weeks old showing powdery character.

described by Grütz. Its pathogenic significance, however, remained doubtful. Hartmann maintained that his organism was *Cephalosporium* or *Hyalopus*, and that Grütz' organism was of the same nature.

2. Boucher, H.: Bull. Soc. path. exot. **11**:306, 1918.

3. Hartmann, E.: Association of Cephalosporium and Trichophyton Gypseum, Dermat. Wchnschr. **82**:565 (April 24) 1926.

In 1927, Benedek [4] isolated *Cephalosporium* from brownish-red, dry, sharply marginated eczematous lesions of five years' duration on the elbows of a woman 58 years of age.

Cabrini and Redaelli,[5] in 1929, reported a tonsillar infection with *Cephalosporium acremonium* Corda.

REPORT OF CASE

History.—V. C., a man, aged 28, born in Missouri of Swedish parents, had lived in Stockton, San Joaquin County, Calif., for the past year, and prior to that in Missouri. He was employed as a bookkeeper. He had been married for five years and had one child, 4 years of age. He had had no adult illness, and he said that he had not had venereal infection. He used neither alcohol nor tobacco.

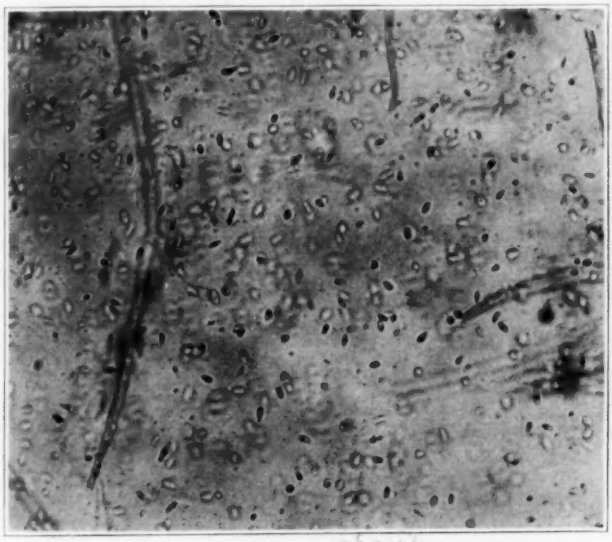

Fig. 6.—The powdery material from a culture is seen to be made up almost entirely of spores.

Examination.—On March 28, 1930, examination showed a slightly painful, hard mass of a month's duration, the size of a pullet's egg, in the area of the left tonsil and the soft palate. In the involved part of the left side of the soft palate was a perforation the size of a lima bean. Both tonsils were large and cryptic. The patient stated that for three weeks prior to the development of the lesion in the throat he had "quinsy." This seemed to "break," with the discharge of a small amount of serosanguineous material. Since this time the mass had been enlarging

4. Benedek, T.: Comparative Studies of Varieties of Cephalosporium Including a New Species, Cephalosporium Niveolanosum, Arch. f. Dermat. u. Syph. **154**:154, 1927.

5. Cabrini, C., and Redaelli, P.: Tonsillar Infection by Cephalosporium, Acremonium Corda, Bull. Soc. méd.-chir. di Pavia **4**:475, 1929.

rapidly. There was a firm, nonpainful gland the size of a pullet's egg under the angle of the mandible and a few smaller ones extending down the edge of the sternomastoid muscle.

The Wassermann and Kahn reactions of the blood were negative. Stained and unstained smears from the area revealed only the usual organisms in the mouth. Examination of the blood showed 12,200 white cells with 62 per cent neutrophils, 34 per cent small lymphocytes, 2 per cent mononuclears and 2 per cent eosinophils.

Fig. 7.—Low power photomicrograph of tissue removed from the edge of the perforated area. Note the dense endothelial reaction deep in the section.

Treatment.—The administration of arsphenamine intravenously and 10 drops of potassium iodide three times a day did not appreciably affect the lesion. Under the treatment with 40 drops of iodide, three times a day, and one massive dosage of the roentgen ray, the lesion was greatly improved in ten days and became entirely well in three weeks. Unfortunately, the fungus appeared on the culture mediums on the day that the roentgen treatment was given. It is therefore impossible to state whether the roentgen rays or the iodide cleared the lesion.

When this article was written the patient had remained entirely well for the ten months that had elapsed since the treatment had been given.

THE ORGANISM

Cephalosporium was first described by Corda in 1839. It was said to be a harmless saprophyte, not pathogenic to man, and it was generally found on decaying vegetable matter. Since this original description from sixteen to eighteen species of the genus *Cephalosporium* have been described. These species vary in size and somewhat in cultural characteristics, but all are similar. They closely simulate the genus *Acremonium Link*, 1809, and much of the literature on the subject is a spirited discussion between Grütz and Benedek as to the proper classification of the organism.

We have been unable to find *Cephalosporium* listed in any medical classification of fungi. It has a septate mycelium; asci and mycelial hyphae are absent, and it reproduces by conidia which are borne on true conidiophores. This should classify it under *Fungi imperfecti*, of the order *Conidiosporales*, the suborder *Sporophoralineae* and the genus *Cephalosporium* Corda 1839.

Smears from our patient did not show the presence of the fungus. Fresh and stained specimens from the culture gave the following characteristics: There is a very fine mycelium with upright nonseptate conidiophores bearing a group of conidiospores that are stuck together in a mass at the end of the conidiophore. The spores take the Gram stain, while the mycelium does not. The organism is similar to *Sporotrichum*, but differs in that *Cephalosporium* has upstanding and ramified side branches and that the conidia are apiculate at both ends. These fall off after ripening, whereon succeeding groups form. This fructification is so rapid that cultures several weeks old consist almost entirely of spores.

Cultures.—The organism found in this case grew weakly on Sabouraud's medium. At the end of ten days at room temperature, a thin gray, translucent growth could be seen appearing at the edge of a contamination colony. At a later date, when the fungus was creeping along the wall of the test tube, its growth could be watched under the microscope. A very delicate mycelium could be seen with ellipsoidal conidia at the ends of rather long, threadlike conidiophores or the terminals of hyphae.

In older cultures (from six to twelve weeks old) the growth was entirely different. It was blackish gray and powdery with a moundlike elevation in the center. On microscopic examination this central powderlike material was found to be made up almost entirely of spores that had been liberated from the conidiophores. The organism did not produce gas in any of the sugar mediums, but it liquefied gelatin in three or four weeks.

It grew best at from 18 to 20 C., did not grow well at 37 C., and died in twenty-four hours at 40 C.

The literature contains careful measurements of the different species of the genus *Cephalosporium* and its cultural characteristics. Space will not permit us to give them here. The organism isolated from the patient in this report does not seem to correspond to any of the known species. In the older cultures, the blackish-gray color and the powdery appear-

Fig. 8.—High power photomicrograph showing slight infiltration with round cells just under the epidermis.

ance are apparently distinctive features. The proper classification of the organism is a problem for the mycologist, not the clinician.

Animal Inoculations.—The organism isolated from our patient was not pathogenic for laboratory animals. Guinea-pigs and rabbits were given subcutaneous and intraperitoneal injections. Dr. Weidman obtained negative results by intraperitoneal and intratesticular injections into rats. Similar negative observations have been reported by all

observers. Benedek [6] stated that failure to transmit the disease to animals may be due to the fact that the organism dies out quickly at 37 C., and that guinea-pigs, rabbits and rats have a body temperature approaching 40 C.

Serology and Immunology.—Benedek [6] discussed serologic diagnosis in detail and maintained that it is the best means of establishing the pathogenicity of the organism. It has been impossible to carry on serologic studies in our case owing to the fact that the patient lives at a distance from San Francisco. Benedek [6] advised making a Wassermann test with homologous serum and a complement-fixation test

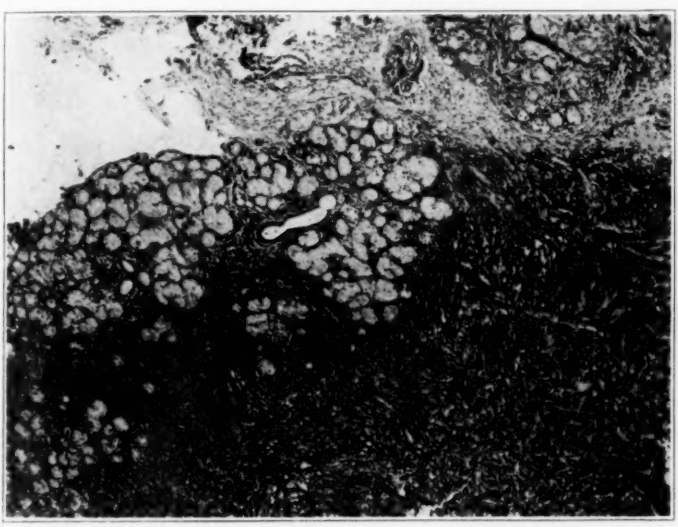

Fig. 9.—High power photomicrograph showing infiltration with endothelial and round cells.

according to the method of Widal-Abrami, with numerous strains of molds and yeasts of known pathogenicity as controls. He stated that syphilitic serums must always be excluded from the tests, as they often fix fungi.

Henrici [7] was unable to demonstrate precipitins with the serums of rabbits intensely immunized with cell sap of *Cephalosporium acremonium*.

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6. Benedek, T.: Cephalosporiosis; Serum Diagnosis, Arch. f. Dermat. u. Syph. **154**:96, 1927.

7. Henrici, A. T.: Moulds, Yeasts and Actinomyces, New York, John Wiley & Sons, Inc., 1930, p. 58.

Pathology.—Tissue was removed on several occasions for pathologic study. Owing to the location of the lesion, satisfactory material was difficult to obtain.

There was a moderate infiltration with round cells, especially around the enlarged blood vessels in the area immediately under the epidermis. Deep in the tissues there was a dense infiltration with endothelial and round cells. This was so definite that it was thought that a neoplasm might be present, i. e., an endothelioma. Further study seemed to suggest a profound endothelial reaction to some infection. It was impossible even with special staining to demonstrate the fungus in the tissues.

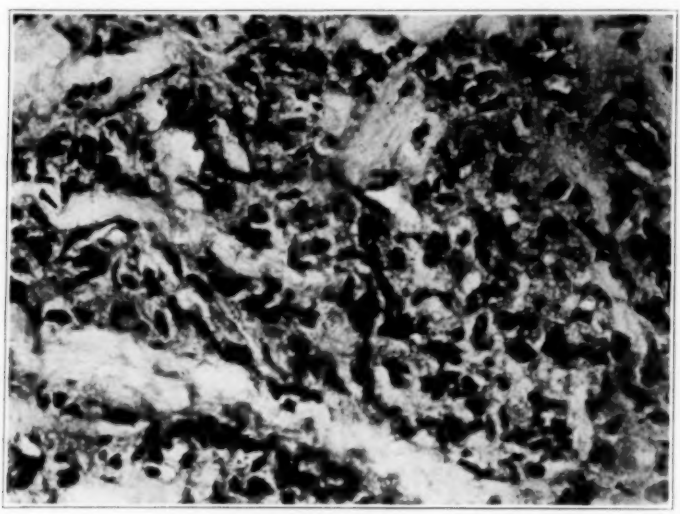

Fig. 10.—Oil immersion photomicrograph of infiltration with endothelial and round cells.

We have been unable to find any reports on the pathologic picture found in this disease.

Therapy.—Roentgen therapy or potassium iodide cleared the lesions in the reported cases. In our case both were used. Small doses of iodide did not seem to be of benefit, but large doses caused the lesions to clear up within two or three weeks.

SUMMARY AND CONCLUSIONS

A case is reported in which the patient had a gumma-like lesion of the soft palate and tonsillar region from which a fungus was isolated and tentatively classified as *Cephalosporium.*

Five cases of human lesions due to this *Sporotrichum*-like organism have been reported in the foreign literature in the past few years. Similar cases have not previously been reported by American observers.

The organism, injected intraperitoneally and subcutaneously, was found to be nonpathogenic for the rat, guinea-pig and rabbit.

The disease cleared up in three weeks under the use of large doses of potassium iodide and roentgen therapy.

The true pathogenic rôle of *Cephalosporium* has not been proved in this case or in most of the reported cases. The similarity of the lesion in this patient to those previously described, the exclusion of other etiologic organsims and the response to therapy seem to justify the diagnosis of cephalosporiosis.

384 Polk Street.

We received assistance from Dr. Harry Kaplan, of Stockton, Calif., in the study and care of this patient, from Miss Bernice Eddy of the Hooper Foundation in the animal inoculations, from Miss Paula Schoenholz in the German translations and from Dr. Fred Weidman in the classification of the organism.

ABSTRACT OF DISCUSSION

DR. FRED D. WEIDMAN, Philadelphia: Through the kindness of Dr. Morrow and Dr. Miller, I saw this patient, and was much gratified to see that they had done things in the big way for which the Coast is famous; they had taken the trouble to do these very difficult biopsies on the tonsils. It is entirely proper that this case should be reported. For the tonsils, fungus organisms are not commonly so destructive (save actinomycosis) as we see in this case. Castellani (Castellani, A.: Fungi and Fungous Diseases, ARCH. DERMAT. & SYPH. **17**:69 [Jan.] 1928), for instance, in his work on the tonsillomycoses, did not report any lesions that were as marked as those shown in this patient.

Credit for the isolation of the micro-organism and for the photographs is due to Dr. Hiram E. Miller. My part was only on the determinative side. After all, the only point about this case that remains debatable is whether the cephalosporium isolated is the pathogen in the case. But here we are no worse off than in many other accepted cases of mycoses; South American dermatologists report chromoblastomycosis due to Acrotheca and other cases due to Phialophera, without reproducing the disease in animals. In the same way, we can go down through a long list of accepted mycoses the agent of which has not satisfied all the laws of Koch.

I think the favorable response to fungicidal treatment and the fact that this organism was not of the quickly growing kind are additional points in favor of its being the pathogen in the case.

DR. HOWARD MORROW, San Francisco: Replying to Dr. Weidman, I can only repeat what is stated in our paper. We have been unable to find the cephalosporium listed in any medical classification of fungi. It has a septate mycelium, an absence of asci and mycelial hyphae, and reproduces by conidia, which are borne on true conidiophores. This should place it under Fungi imperfecti, of the order Conidiosporales, the suborder Sporophoralineae and the genus Cephalosporium Corda, 1839.

LUPUS ERYTHEMATOSUS

AN EVALUATION OF HISTOPATHOLOGIC EXAMINATIONS *

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AND
HAMILTON MONTGOMERY, M.D.
ROCHESTER, MINN.

In some instances histologic examination of lesions of the skin of various types for diagnostic purposes is conclusive; in other cases such examination has little, if any, merit, and in still other cases such examination may not be specific, but may possess considerable value. Lupus erythematosus belongs to the last group. Considerable diagnostic evidence can be obtained by proper evaluation of a combination of histologic changes which, taken separately, are not significant. A summary of such an estimate is attempted in this study, based on twenty-six cases of the discoid type and eighteen cases of the disseminate type. The results obtained are emphasized regarding: (1) changes as accepted in the modern literature; (2) changes concerning which the authors are not agreed; (3) comparison of changes in the discoid and disseminate types, and (4) value of the changes in differential diagnosis.

CHANGES AS ACCEPTED IN THE MODERN LITERATURE

A review of the literature makes it apparent that with the development of better methods of histologic study a combination of significant changes has gradually emerged from the rather chaotic state of previous numerous reports. The publications of Unna,[1] Jadassohn,[2] Schoonheid,[3] Fordyce and Holder,[4] Ehrmann and Falkenstein,[5] Kyrle,[6] Gans [7] and

* Submitted for publication, Feb. 8, 1931.

* From the Section on Dermatology and Syphilology, the Mayo Clinic.

* Read at the Fifty-Fourth Annual Meeting of the American Dermatological Association, Toronto, Canada, June, 1931.

1. Unna, P. G.: Histopathology of the Diseases of the Skin, New York, W. F. Clay, 1896, p. 580.

2. Jadassohn, Josef, in Mraček, Franz: Handbuch der Hautkrankheiten, Vienna, Alfred Hölder, 1904, vol. 3, p. 332.

3. Schoonheid, P. H.: Zur Histopathologie des Lupus erythematodes und der elastischen Fasern, Arch. f. Dermat. u. Syph. **54**:163, 1900.

4. Fordyce, J. A., and Holder, O. H.: Some Clinical Observations on Lupus Erythematosus; the Pathology of Lupus Erythematosus, Med. Rec. **58**:41, 1900.

5. Ehrmann, S., and Falkenstein, Fritz: Ueber Lupus erythematodes, Arch. f. Dermat. u. Syph. **141**:408, 1922.

6. Kyrle, Josef: Vorlesungen über Histo-Biologie der menschlichen Haut und ihrer Erkrankungen, Berlin, Julius Springer, 1927, vol. 2, p. 193.

7. Gans, Oscar: Histologie der Hautkrankheiten, Berlin, Julius Springer, 1925, vol. 1, p. 534.

others justify definite enumeration of such changes. With due regard to their relative significance only, they consist of dilatation of the superficial capillaries and lymphatics; perivascular lymphocytic infiltrate in the upper layer of the cutis; persistent relative, and even absolute, hyperkeratosis; usually, thickening of the stratum granulosum; keratotic plugging of the hair follicles and sweat ducts, and necrotic plugging of the epidermis independent of these follicles and ducts; areas of acanthosis and atrophy of the epidermis, and colliquative degeneration of the basal layer. To the presence of these we can subscribe fully on the basis of our material (figs. 1 and 2). Although the degree of individual changes varied, the significance of these rather distinctive changes in combination became increasingly clear as the study progressed.

CHANGES CONCERNING WHICH THE AUTHORS ARE NOT AGREED

Other histologic changes seen in lupus erythematosus, the importance of which as part of the specific picture is still debatable, will be considered on the basis of our material. Considerable emphasis has been placed on the degenerative changes in the connective and elastic tissues, especially the merging of the two to form large masses of collacin. In only eighteen of the twenty-six cases of the discoid type was collacin found, and in all but one case biopsy was made of tissue from the face; in the one case it was made from the scalp and did not reveal collacin. In three of the cases in which collacin was found there were definite clinical senile changes and in two of these cases there was microscopic evidence of senility at a considerable distance from the lupus erythematosus. In only three cases of the disseminate type was collacin in evidence, and in these biopsy was made from exposed areas. In none of the others of the disseminate type (in these the biopsy was made from protected areas) was there formation of collacin. So-called senile skin may be seen at almost any age, especially in the parts exposed to the elements, and it is our impression that formation of collacin is dependent on senile changes rather than on the effect of lupus erythematosus. Collacin is by no means constantly present in the latter disease and cannot, therefore, be regarded as of much significance.

We were unable to find any true proliferative changes in the walls of the blood vessels. Occasionally edematous changes occurred in the walls of the superficial vessels with partial or even complete occlusion. The deeper vessels were always unaltered, except in cases in which there was a history of radiotherapy or gross evidence of radiodermatitis. The absence of true proliferative changes was so uniform that this negative observation might, in some cases, assume considerable diagnostic significance. In about 80 per cent of our cases there was a deposit of pigment in the chromatophores in the cutis, usually beneath the areas

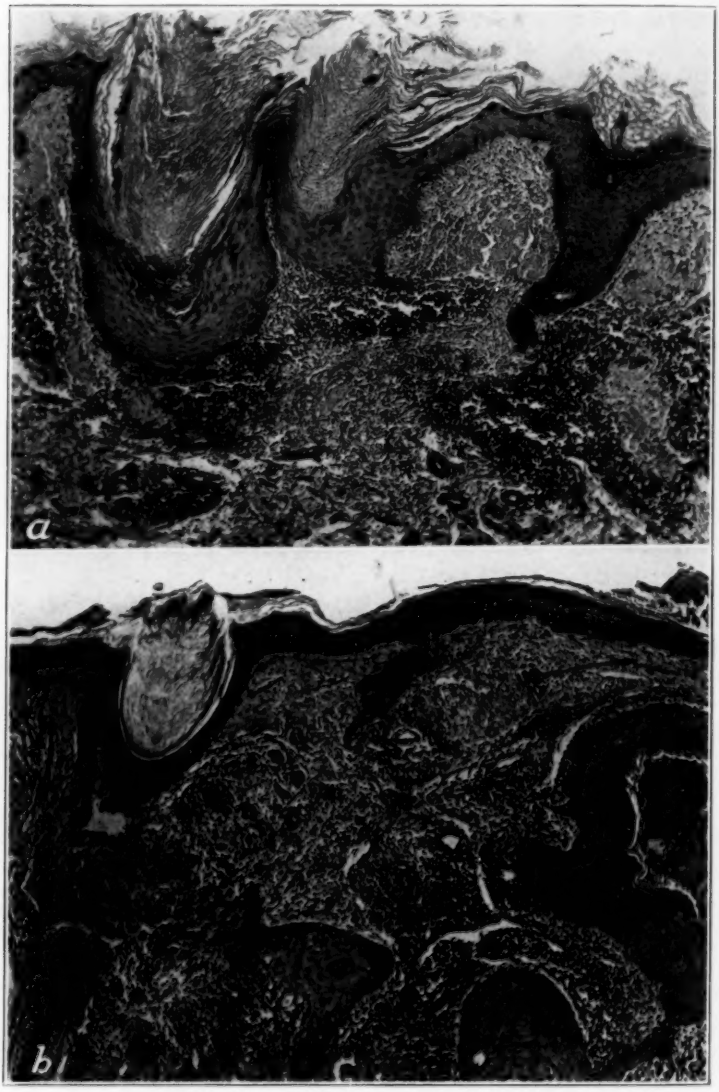

Fig. 1.—*a*, discoid type of lupus erythematosus from the cheek, of four years' duration. Keratotic plugging of a hair follicle and of a sweat duct; also, hyperkeratotic plug in the epidermis independent of either the follicle or the duct. Hyperkeratosis, irregular acanthosis, collacin in the pars papillaris and dense perivascular masses of lymphocytes with colliquative degeneration of the epidermis in one region. Hematoxylin and eosin; × 65. *b*, discoid type of lupus erythematosus from the cheek, of three months' duration. Keratotic plugging of a hair follicle with atrophy of the epidermis, dense lymphocytic infiltrate in the cutis with foreign body giant cell reaction about the hair follicle and cyst. Hematoxylin and eosin; × 50.

of colliquative degeneration. Staining with silver nitrate showed this pigment to be melanin. The results of staining for hemosiderin were always negative. There was at times a decrease of content of pigment in the epidermis, suggesting absorption of the pigment of the altered cells by the chromatophores. This phenomenon in itself is probably of little diagnostic value, but in conjunction with some of the other changes it is of considerable significance. The presence of other changes that have occasionally been emphasized did not seem of signifi-

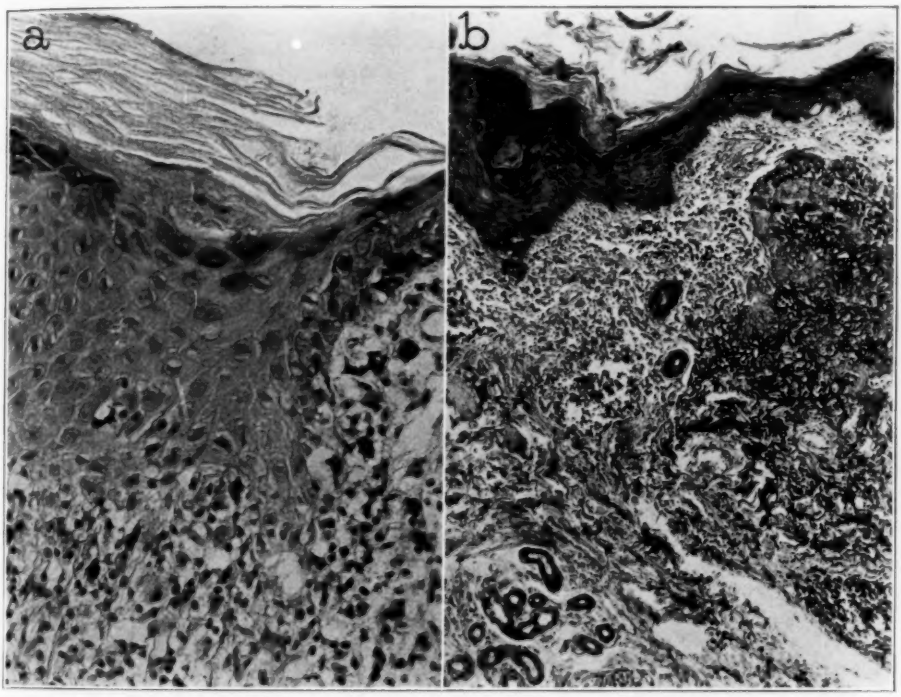

Fig. 2.—*a*, discoid type of lupus erythematosus from the cheek, of three years' duration; colliquative degeneration of the basal cell layer and chromatophores in the cutis laden with pigment staining black. Silver nitrate and hematoxylin; × 250. *b*, discoid type of lupus erythematosus from the cheek, of three months' duration. Keratotic plugging of a sweat duct, dilatation of the lumina of the sweat glands, destruction of the elastic tissue where the infiltrate occurs, and a mass of collacin in an upper right corner; Elastin H; × 65.

cance in our series. Few plasma cells were found even in the early stages. Occasionally a considerable number of polymorphonuclear leukocytes and eosinophils were present, probably the result of secondary infection or subacute exacerbation. There was no hypertrophy of the

sebaceous glands, but they were usually well preserved even in the presence of a dense infiltrate. Fatty degeneration of the sebaceous glands and destructive invasion of their walls were occasionally seen. The lumina of the sweat glands were often dilated, which was readily explainable by the hyperkeratotic plugging of the orifice of the duct. In two cases, by use of a mucicarmine stain, traces of mucin were found in the upper layer of the cutis, chiefly perivascular, but also near the hair follicles. In one case in which radiotherapy was applied some-

Fig. 3.—Discoid type of lupus erythematosus from the nose, of three and a half years' duration. Patient also had a sarcoid of the cheek. Keratotic plugging and atrophy of the rest of the epidermis; acanthosis about the hair follicle at the right. Epithelioid tubercle with a giant cell deep in the cutis and adjacent perivascular infiltrate involving the walls of the vessels. Hematoxylin and eosin; × 60.

what intensively, an early squamous cell epithelioma with some remaining activity in the lupus erythematosus was found. There seemed to be no direct histologic relationship. A true tuberculoid reaction was not found except in one case in which sarcoid of the face was associated. In this case there was a typical picture of lupus erythematosus with an epithelioid tubercle deep in the cutis (fig. 3). Parakeratosis was seen in only two cases in the discoid type, and in these it seemed secondary to

treatment. It was seen in several cases of the disseminate type, usually when vesicular formation was pronounced. It is probably not of any diagnostic significance in either type. Our histologic material on lesions of the mucous membrane was too meager from which to draw conclusions.

COMPARISON OF CHANGES IN THE DISCOID AND DISSEMINATE TYPES

We have considered particularly the discoid type of lesion, but the disseminate type (figs. 4 and 5), acute and subacute, tends to show

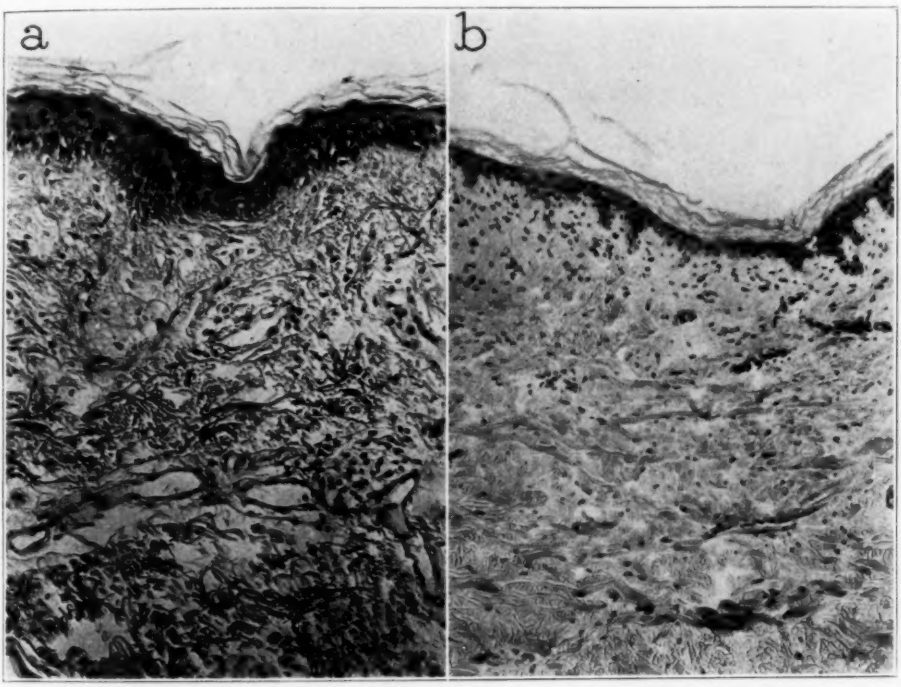

Fig. 4.—*a*, acute disseminate type of lupus erythematosus in early nonspecific stage; lack of hyperkeratosis; pyknosis of the basal cells; dilatation of the superficial capillaries, lymphatics and lymph spaces in an upper layer of the cutis; fragmentation of the collagen fibers, and sparse perivascular infiltrate. Hematoxylin and eosin; × 150. *b*, acute disseminate type of lupus erythematosus in the end-stage. Relative hyperkeratosis, atrophy of the rest of the epidermis, and scar tissue. Hematoxylin and eosin; × 60.

similar changes, but in relatively different degrees. The earliest changes were the same in both types, consisting merely of vasodilatation and edema of the upper layer of the cutis. Since these changes are common in other diseases, and since lupus erythematosus tends to show other

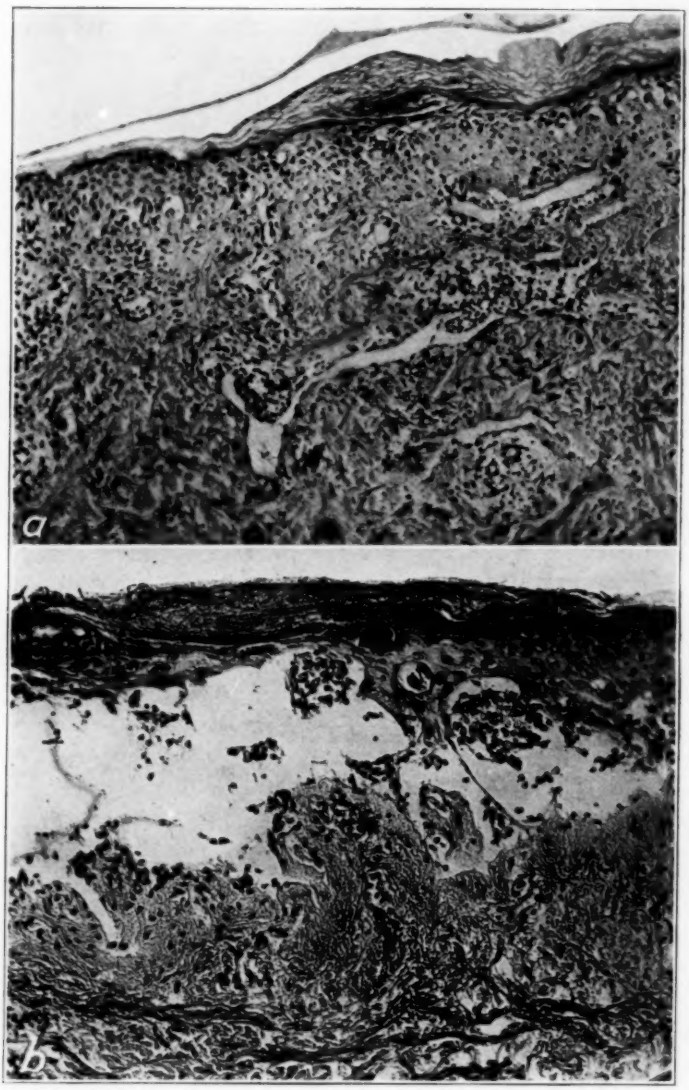

Fig. 5.—*a*, acute disseminate type of lupus erythematosus from the neck, of four months' duration. Relative and absolute hyperkeratosis, with marked atrophy of the epidermis beneath; liquefaction necrosis of the basal cell layer; edema of the cutis, with dilatation of the superficial capillaries and lymphatics, and moderate perivascular infiltrate. Hematoxylin and eosin; × 60. *b*, acute disseminate type of lupus erythematosus from the forearm, of eight weeks' duration. Relative and absolute hyperkeratosis. No parakeratosis in spite of the subepidermal bulla containing leukocytes and débris of epithelial cells. Hematoxylin and eosin; × 125.

suggestive changes early, biopsy for diagnostic purposes should be made from a patch of more than two weeks' duration. It is also desirable to select a section that has not been treated recently, as this may materially alter the picture. In our series the disseminate type showed less proliferative change and more atrophic change in the epidermis; the acute type often showed a tremendous thinning with disappearance of the rete ridges and frequently the appearance of intra-epidermal or subepidermal vesicles. Keratotic plugs were seen microscopically before they were apparent clinically. Colliquative degeneration was a more striking feature even than in the discoid type. Even when vesiculation or bullous formation was present the stratum corneum usually remained intact. When vesiculation was marked, parakeratosis and crusting were sometimes associated. Extravasation of serum into the cutis was frequently seen, but hemorrhage was rarely seen. Collacin was present in only three of the eighteen cases of the disseminate type; in two cases the biopsy was made from the tissue of the neck and in one case from tissue in the upper sternal region. Atrophy of the sebaceous glands was more common, but the sweat glands were relatively unaltered. Deposits of pigment in the chromatophores in the cutis were present in varying amounts in the eighteen cases. In some cases there also seemed to be an increase in the epidermal pigment. In the end-stage of the acute type the edema and infiltrate had largely disappeared, but left atrophy of the epidermis with persistence of relative hyperkeratosis. Whereas it is often possible to distinguish between the discoid and disseminate types of lesions by careful histologic study alone, it will readily be seen that a sharp dividing line cannot be drawn, because the same changes are present in both, only varying in degree. Our histologic data supported the clinical conception that the virus is the same, whether the manifestations are of the most chronic or the most acute type; all gradations and transitional stages may be seen between, and the degree of reaction in the tissue is probably dependent on the patient's resisting qualities at a given time. It was not possible accurately to anticipate dissemination, or to determine the duration of the disease on microscopic examination alone, because often a chronic case would reveal acute exacerbation, or the discoid type would develop all its cardinal changes in a short time.

VALUE OF THE CHANGES IN DIFFERENTIAL DIAGNOSIS

Any one familiar with the varied clinical manifestations of lupus erythematosus and its close resemblance at times to diseases belonging in totally different categories must agree that help from the laboratory, either supporting a clinical opinion, or possibly rendering it doubtful, is frequently desirable. One need but glance through the literature to find

that the seborrheic, the erythematous, the bullous, the lichenoid, the psoriasiform and the erysipeloid types are recognized. It would seem that certain diseases of the skin, some rather closely related and others not, are especially difficult to differentiate. We have encountered the most trouble with lupus vulgaris erythematoides, elevatum diutinum, granuloma annulare, lupus miliaris faciei, perniones, seborrheic dermatitis, senile keratosis, sarcoids, late syphiloderma and the more or less persistent types of erythema, such as erythema multiforme, erythema perstans, fixed drug eruptions and possibly lichen planus. Of less importance but not to be ignored were psoriasis, parapsoriasis, eczema, bromoderma, blastomycosis, epithelioma, tuberculosis verrucosa cutis, pityriasis rubra pilaris, erysipelas, pellagra, acrodermatitis chronica atrophicans, scleroderma and poikiloderma atrophicans vasculare. It is not our object here to enter into details of the histologic changes that make for differentiation in these various diseases. We believe, however, on the basis of our study, that if the cardinal changes noted are given due consideration as to their relative merits and combinations, histologic examination of tissue will prove a valuable aid in distinguishing lupus erythematosus from other diseases of the skin. In our series the greatest difficulty in actually reaching a diagnosis when clinical observations were also taken into consideration were encountered rarely in lichen planus (fig. 6) and senile keratosis, but even in these cases careful study of a series of sections permitted correct differentiation. Our material does not permit a consideration of the syndrome of lupus erythematosus and pemphigus described by Senear and Usher.[8] We are fully aware that there are certain acute types of disease associated with a persistent purplish flush of the face that are probably the equivalent of Kaposi's erysipelas perstans faciei and are usually rather rapidly fatal. In our experience these types have been most commonly associated with malignant endocarditis. Whether they belong genetically to the disseminate type of lupus erythematosus is difficult to determine. It is possible that they represent the most acute form of the disease and that the process is so acute that the accepted histologic changes do not occur. The material studied did not include cases of this type, but it did include several cases in which the disease proved fatal within about a year from the time of onset of the lesions of the skin. Even in these acute cases, when the individual lesion had persisted for more than a month the changes were sufficiently characteristic to be of differential diagnostic value.

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8. Senear, F. E., and Usher, Barney: An Unusual Type of Pemphigus: Combining Features of Lupus Erythematosus, Arch. Dermat. & Syph. **13**:761 (June) 1926.

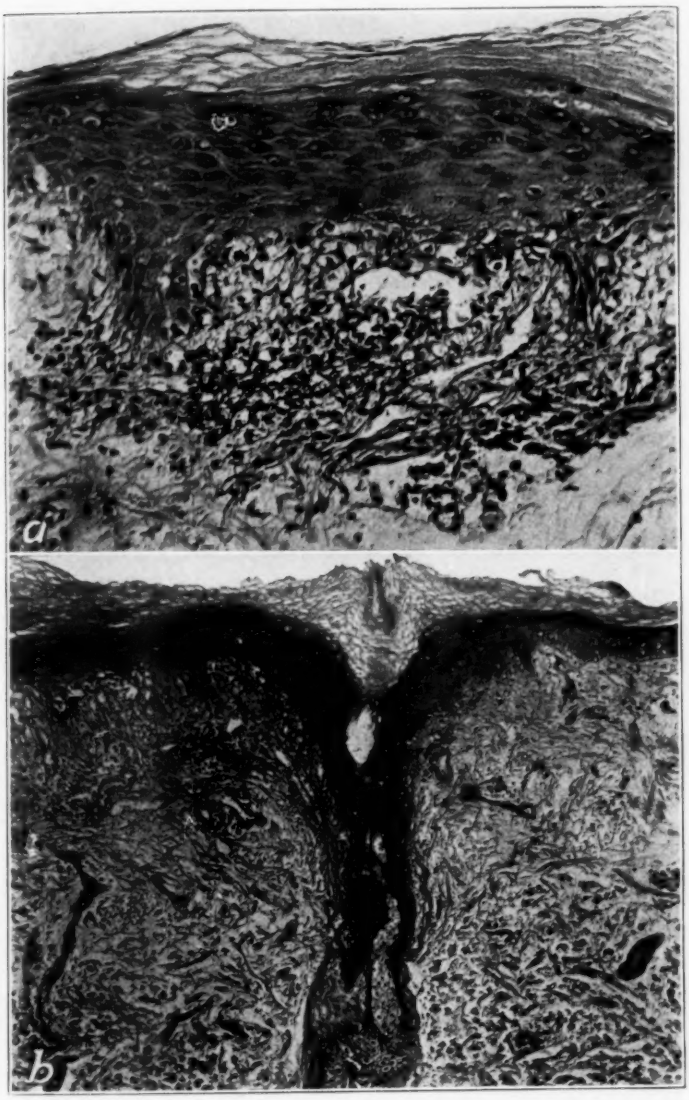

Fig. 6.—*a*, subacute disseminate papular type of lupus erythematosus of one year's duration; all the features of a lichen planus papule. Hematoxylin and eosin; × 175. *b*, relative and absolute hyperkeratosis, plugging of a hair follicle, changes simulating lichen planus at the left of the follicle; from the same case as *a*. Hematoxylin and eosin; × 60.

SUMMARY AND CONCLUSIONS

A combination of histologic changes has gradually become recognized as being of real diagnostic value in lupus erythematosus. Our study of twenty-six cases of the discoid type and eighteen of the disseminate type has convinced us that these changes are practically always present in a degree to be distinctive. In addition to these, the absence of proliferative vascular changes and the common occurrence of pigment in chromatophores may be of diagnostic value in some cases, but formation of collacin cannot be regarded as particularly significant. A number of changes that have at times been emphasized are merely incidental. The changes in the discoid and disseminate types are the same and vary only in degree; a sharp dividing line cannot be drawn. Because of the varied and sometimes puzzling clinical manifestations of lupus erythematosus, the aid of the laboratory in diagnosis is desirable. If due consideration is given to the relative merits and the combination of histologic changes, examination of tissue should prove a valuable aid in distinguishing lupus erythematosus from other lesions of the skin.

ABSTRACT OF DISCUSSION

DR. J. FRANK FRASER, New York: Concerning the case in which an associated sarcoid was reported, I should like to ask Dr. Goeckerman whether it is not possible to explain the changes found on microscopic examination on the basis of sarcoid alone? May not one see in sarcoid besides the epithelioid tuberculous structures round cell infiltration, hyperkeratoses, plugging of the follicles and other changes found in lupus erythematosus? If this is true, why should it be necessary to introduce a second factor into the diagnosis? In other words, why not one diagnosis—sarcoid?

A combination of the two diseases occurring in the same case is possible, the lesion of lupus erythematosus on one side of the face and that of sarcoid on the other, or even on the same side. Nevertheless, if one diagnosis explains the condition, why make it multiple?

In regard to the finding of collacin in the lesions, how does it come about that some pathologists regard the presence of collacin and associated atrophy as a characteristic feature in the histology of lupus erythematosus? If these changes are due solely to exposure, one ought to find collacin with equal frequency in all other lesions occurring on the face or other exposed parts. This suggests the question: How frequently do we find collacin in cases of lupus erythematosus occurring on nonexposed areas?

DR. DAVID L. SATENSTEIN, New York: From the presentation one concludes that the histologic features are those of an exudative inflammatory process in the upper cutis with changes in the epidermis which predominate, and that the degenerative changes, the collacin and a basophilic tinctorial degeneration of normally acidophilic tissue elements, are dependent on senile changes rather than on the effect of lupus erythematosus. From the presenters' discussion one must conclude that the clinical atrophy, when it does occur, is the result of the epidermic changes; for nowhere in their presentation is there evidence of any accepted changes leading to the clinical atrophy other than those of the epidermis.

In the literature one finds the following: Kyrle quoted and agreed with Schoonhoid that the elastic degeneration as the result of the edema is characteristic of lupus erythematosus discoides; that the epidermic changes are not specific and are secondary depending on the primary changes in the cutis. Unna stated that aside from the primary hyperkeratosis the epidermis changes are not part of the disease proper; that they are only a transient increase of the chronic process; and he definitely stressed the degeneration of the collagen and disappearance of the elastic fibers. Kreibich stated that epidermic changes are secondary to the primary changes in the cutis; that lupus erythematosus discoides, like other atrophies of the skin, is a chronic inflammatory process in the course of which there is an atrophy of the collagenous elements. Lewandowsky found that the elastic fibers disappear from within the cellular infiltration, and that the changes in the cutis are primary and the epidermic changes secondary; in the terminal stage, he called attention to the disappearance of the elastic tissue and the sclerosis of the connective tissue. Torok stated that the epidermic changes vary in intensity and are secondary to the changes in the cutis; he found basophilic degeneration and also referred to other types of degeneration. Finger found degeneration of the cellular elements and of the connective tissue elements and disappearance of the elastic fibers. Gans called attention to the disappearance of the elastic fibers in the cellular infiltration. Fordyce and Holder considered the process an infiltrative one followed by degeneration of the collagenous tissue and subsequent atrophy. Frieboes noted the disappearance of the elastic tissue from within the cellular infiltration. Sutton agreed with Freshwater that the disease is essentially one of the corium, and that the epidermic changes, when they occur, are of a secondary nature.

My conception is that lupus erythematosus discoides is a chronic, for a variable time an acute, inflammatory process terminating in atrophy; that the changes in the cutis are primary and depend on the intensity of the edema; that the epidermic changes are secondary and are not any more specific than in any other eczematous process; that the atrophy is preceded by basophilic degeneration and disappearance of the elastic fibers; that without the degeneration a histologic diagnosis of lupus erythematosus discoides is not possible. Again, in those cases in which the epidermis is clinically not involved, and in which there is no scale or plug formation or hyperkeratosis, the basophilic degeneration is often the important factor in the diagnosis.

The presenters state and agree with Gans that senile changes may occur at any age; that would close the door to all discussion on the subject of degeneration, if the statement is accepted as final. It is curious that one finds the basophilic degeneration in the edematous portion and not in the surrounding zones; that the degeneration increases during the evolution and begins to disappear during involution, and entirely disappears in the atrophic stage.

I base my findings on a study of more than 100 cases of lupus erythematosus of the fixed type; without the basophilic degeneration, I do not make a diagnosis of lupus erythematosus discoides.

The presenters state that the degeneration was not a feature in their cases of the disseminated type; that is no surprise. To me, this type is an exudative inflammatory process of varying intensity, usually severe, with a clinical history of the onset, course and termination entirely different from that of the fixed types; the only thing in common with the two types is the name lupus erythematosus. I cannot make a histologic diagnosis of lupus erythematosus disseminatus from the microscopic evidence; there is nothing distinctive about it.

Dr. Fred D. Weidman, Philadelphia: Many of the considerations in my own paper involving senile elastosis apply to the study of lupus erythematosus. One of the questions raised, namely, why it is that we see a tendency to hyperplasia of elastic tissue on the face and not on other parts of the body, I think was covered in the section having to do with jaundice, in which you may recall I stated that the intensity of the yellow discoloration is much more marked on the face and upper portions of the body than on the lower portions. It may be that the explanation of that phenomenon is that there is normally a larger proportion of the elastic tissue here than in the lower parts of the body. Incidentally, the term "senile elastosis" does not connote the age of the patient. It indicates a disease that, like arteriosclerosis, is found more often but not exclusively in the elderly, and therefore still remains as a factor in connection with lupus erythematosus. Again, the term "presenile" means only that there is a precocious tendency to the development of this condition.

A point I wish information on is the mucin spoken of in Dr. Goeckerman's paper. There are three kinds of mucin (true, para and pseudo); paramucin is the only one that should be found in lupus. In this variety, the fibrous tissues take on the embryonal form; stellate cells appear, in the meshes of which there is the blue granular precipitate of mucin. I have not seen as many cases as Dr. Goeckerman, but I would like to be informed whether this was the appearance given when mucin degeneration occurred in the cases of lupus erythematosus that he described.

Dr. Clark W. Finnerud, Chicago: Although I agree with everything Dr. Satenstein said, I wonder if he did not miss the point of the paper. I think that the essayist intended to make the point that although the histologic changes in lupus erythematosus are not pathognomonic, the combination of changes described by the authors is practically constant and speaks for lupus erythematosus, whether of the discoid or of the disseminate type, a fact that is of utmost importance in differentiating it from other disorders.

Dr. W. H. Goeckerman, Rochester, Minn.: I did not bring this question up for controversy. The study was carried on for some time, as leisure permitted. We could not systematically adhere to it, but I present the findings as they were. The effort was to see how our own findings taken in connection with the reports in the literature would harmonize. I wished to get a personal attitude in relation to the changes reported. If anyone wishes to believe differently, it is all right with us, but the work was carefully done and the literature carefully reviewed. We merely presented the changes as we found them, and I was surprised to find how closely the article in the new "Handbuch" corresponded with our interpretation.

So far as I remember, it was the mucincarmine stain that brought out the changes that we called mucin.

IDIOPATHIC TRICHOCLASIS

REPORT OF A CASE *

CHRIS R. HALLORAN, M.D.
LOS ANGELES

Idiopathic trichoclasis was first described by Jackson.[1] Sabouraud,[2] in a descriptive article on the subject, distinguished three forms of the disease:

1. A rare form of trichorrhexis that is localized in and involves the entire mustache, the hairs presenting five or six pearls or nodules from 3 to 5 mm. apart, and in which relapses continue in spite of the avoidance of trauma.

2. A trichoclasis involving circumscribed rounded or oval patches on the scalp in which hairs are broken off from 6 to 8 mm. from the skin, and in which the skin appears normal, the plaques healing spontaneously, but new areas appearing on other parts of the scalp.

3. A trichoclasis occurring in patches on the scalp, the skin of the plaque being dry, thickened, rough and bound down.

I am at present observing a case of trichoclasis that is similar to the second group of Sabouraud's classification except that the plaques do not heal spontaneously but persist in the same locations in spite of the avoidance of mechanical injury, as in group 1 of his classification. Marcoglou [3] described a case of idiopathic trichoclasis of the Jackson-Sabouraud type conforming in all respects to type 3 of Sabouraud's classification, Jeanselme and Bloch [4] described two similar cases.

REPORT OF CASE

Miss E. C., aged 51, was referred to me because of a condition of the scalp of two years' duration. The history was that two years previously a dollar-sized circumscribed area of broken hairs appeared on the left parietal region of the scalp, to be shortly followed by an oval-shaped similar lesion on the vertex. There was no history of trauma or hairdressing of any type, as the patient had been confined for the past ten years to a sanatorium because of dementia praecox of paranoid type.

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* Submitted for publication, May 28, 1931.

1. Jackson, G. T.: J. Cutan. Dis. **21**:473, 1903.

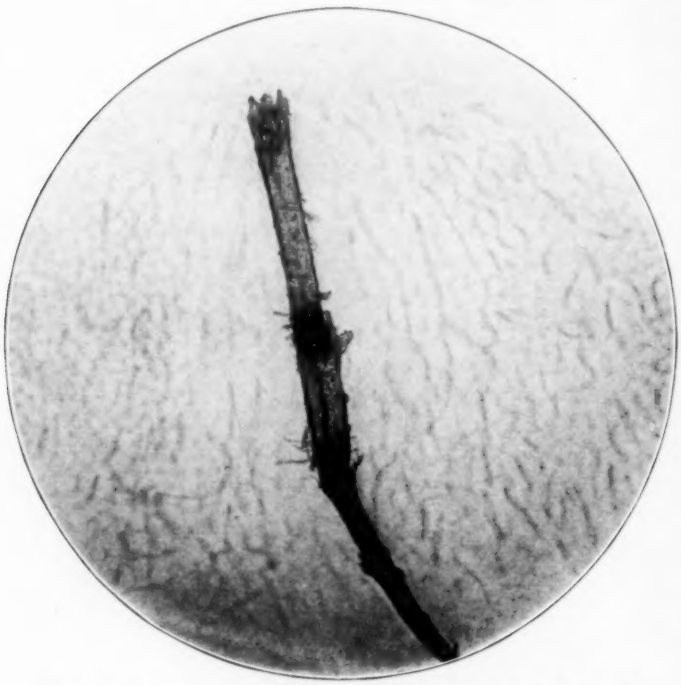
2. Sabouraud, R.: Trichoclases, Trichorrhexis and Trichoptiloses, Ann. de dermat. et syph. **2**:445, 1921.

3. Marcoglou, A.: Idiopathic Trichoplasia of Jackson-Sabouraud, Arch. Dermat. & Syph. **17**:512 (April) 1928.

4. Jeanselme and Bloch: Bull. Soc. franç. de dermat. et syph. **30**:79, 1923.

Antiseptics and parasiticides of various types had been applied without avail. The hair had been clipped and shaved three or four times. Each time the hairs of the involved area grew only to 6 or 8 mm. in length and then appeared to stop growing. There were no subjective symptoms.

On close examination, the scalp presented two lesions, one on the left parietal region about the size of a dollar, the other oval in outline, localized on the vertex and measuring approximately 3 or 4 cm. in width and 6 or 7 cm. in length. These plaques were sharply defined, and the hairs of the patches were approximately from 6 to 8 mm. in length, giving the gross appearance of having been clipped. With the naked eye one or two grayish nodosities could be discerned on the shaft



Hair showing two bursting nodes and splitting of the shaft.

of the broken hairs. However, the hairs were not loosened, and resisted pulling as normal hairs do. The skin of these patches appeared the same as that of the rest of the scalp. There was no scaling, roughening, thickening or erythema, nor did the skin of the involved areas appear to be bound down. The follicular openings were normal.

Microscopic examination of hairs taken at random from the patches revealed that their ends presented a frayed or brushlike appearance. On the shafts were seen nodular swellings (trichorrhexis nodosa). A few of the hairs examined presented two such nodosities; in the majority of them, however, only one was found. Splitting of the shaft of the hair (trichoptilosis) was observed adjacent to these points of bulging of the cortex. Segments that had not been completely severed gave the appearance of two brushes being pressed end to end. Various stages of transverse breaking (trichoclasis) could be readily observed at these points. The

bulbs appeared normal; cultures of several of these hairs were negative. The hairs of the eyelashes, eyebrows and axillary and crural regions were normal. Aside from her neurologic history, the patient had been hospitalized in 1922 for pulmonary tuberculosis from which she apparently completely recovered.

COMMENT

The disorders with which trichoclasis or trichorrexis nodosa may be confused are: monilethrix, trichosporosis nodosa, pseudopelade or folliculitis decalvans, tinea of the scalp and, possibly, alopecia areata and favus. The differentiation of trichoclasis from these conditions, however, is not difficult.

Monilethrix is usually congenital. The "swellings" are fusiform, with atrophy of the shafts between the nodosities. The breaking occurs at these points of atrophy and not within the nodosities. There is often an associated keratosis pilaris.

In trichosporosis nodosa or piedra the nodules are located entirely outside the hair shaft at first, the cortex being invaded only after the cuticle becomes dissolved or broken, and the nodosities are concretions of a fungus growth (Trichosporon giganteum).

In pseudopelade or folliculitis decalvans there is follicular inflammation followed by loosening and falling of the hair resulting in a bald, cicatricial plaque, the border of which may present pustules or crusted points.

Tinea capitis is rarely seen in adults; the plaques are scaly, and Trichophyton can readily be demonstrated.

In alopecia areata the onset is sudden and the hair falls from the involved area, leaving smooth, entirely bald patches.

In favus, the lesions are pinhead to pea sized, saucer-shaped, yellow crusts, and the causative organism (Achorion schoenleinii) can readily be demonstrated.

Concerning the etiology of trichorrhexis nodosa and trichoclasis, opinions are at variance. Many consider mechanical injury to hair when its nutrition is below par as the cause, while others believe the disease to be of bacteriologic origin.

The common forms of trichoclasis and trichorrhexis nodosa in which the hair breaks at various lengths, with or without nodule formation, Sabouraud attributed to trauma incident to hairdressing plus repeated alkaline shampoos. He proved this to be the origin by demonstrating the condition in shaving brushes, and he produced in his own beard, by soaping it twice daily for two weeks, a condition analogous to that of "pearl disease," known to hairdressers. These forms may be cured by clipping or cutting the hair below the level of involvement, and by the avoidance of further trauma.

In the case presented, there was no history of hairdressing of any kind, nor did clipping and shaving of the hair result in cure or improvement of the condition. The patient is hospitalized and has not been observed to trouble her scalp. Treatment of all types up to the present has not influenced the condition.

Sabouraud considered that the series of trichoclases is not complete. This case simulates most nearly the second group of his classification for idiopathic trichoclasis, but differs from this class in that the plaques do not heal spontaneously but remain singularly persistent. I do not know whether or not this case should be classified separately.

1052 West Sixth Street.

RECURRENCE OR REINFECTION IN RINGWORM OF THE HANDS AND OF THE FEET

A STUDY OF THE PERSISTENCE OF THE ORGANISM IN THE TISSUES *

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AND
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DETROIT

In a study of ringworm of the hands and feet and of similar fungous infections, which are becoming relatively and actually more prevalent yearly, one is struck by the number of cases of recurrence at intervals with new active lesions in the same areas or in other areas than those primarily affected. Many of these relapses occur at yearly intervals, while others occur at irregular periods. The question naturally arises, "Are these relapses in the nature of an entirely new infection or are they recurrences due to a renewed activity of a dormant organism?"

As fungous infections are so widespread as to be of serious, nation-wide importance from an economic point of view as well as from the point of view of health, the question cannot be settled without an enormous amount of work in all parts of the country on all phases of the disease.

In the series of 100 cases first studied diseases other than ringworm were included, e. g., seborrheic dermatitis, psoriasis, alopecia areata, dermatitis medicamentosa and pityriasis rosea. Ninety-one were found clinically to be some form of ringworm; this includes cases in both treated and untreated patients.

Microscopic examination for ringworm gave the following results: 67 per cent positive, 28 per cent negative and 5 per cent doubtful. Fewer positive cases were found on culture than would be expected, 34 per cent growing ringworm fungus (twenty-eight *Trichophyton*, six *Epidermophyton*); 66 per cent were negative for ringworm, but many showed fungi of different species. These embraced yeasts, *Monilia nigra* and *Monilia alba*, *Aspergillus* and *Penicillium* including *P. brevicaule*, some of which may possibly be the real pathogenic organism. Some of these fungi often appeared in association with typical *Trichophyton*.

No culture was positive when the microscopic examination was negative, but the converse was not true, which may be accounted for by the fact that in many cases treatment had been administered before cultures were made.

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* Submitted for publication, Feb. 8, 1931.

* Read at the Fifty-Fourth Annual Meeting of the American Dermatological Association, Toronto, Canada, June, 1931.

MYCOLOGIC TECHNIC

Throughout the work, uniform methods were used. For culture medium, the formulas of Sabouraud were used with as little modification as possible. Until some one has worked out a suitable synthetic substratum which will differentiate the species as well as his "proof medium" does, it will doubtless continue to be a standard. Since some of the ingredients he used are not now obtainable, the formulas as actually applied will be given. All mediums were sterilized one-half hour in flowing steam for three successive days.

Proof Medium.—This medium contained the following: maltose (Merck), 4 per cent; peptone (Chassaing), 1 per cent; agar-agar, 1.8 per cent, and water (tap). Proof medium was also used for isolation and identification work. On it, cultures compare more closely with the original descriptions by Sabouraud than on any other yet tried.

Dextrose Medium.—This medium varied from the former in that dextrose (Merck) was substituted for maltose, and Witte's peptone replaced the French peptone. It is useful chiefly for temporary purposes, as when a large amount of growth is required for inoculation purposes. Organisms cannot be maintained long on this medium without greatly changing the appearance of the culture, usually by developing a heavy, velvety habit of growth.

Stock Medium.—This medium varied from the proof medium only in that all sugar was omitted. It is most useful when cultures are to be maintained for a considerable time, e.g., as type species. If transplanted not oftener than bimonthly, they retain original characteristics, when again put on the proof medium, for a longer period than by any other method yet attempted.

All three mediums were adjusted to neutral before placing in flasks or tubes. Subsequent heating often causes a moderate variation, developing a slight acidity which is helpful in discouraging bacteria but allows normal growth of the fungi. If used within a reasonable time, from two to three months, this factor is negligible.

The potassium hydroxide method was used for microscopic preparations. While far from ideal, it will give reasonably satisfactory data if used in not over 30 per cent strength, provided that a sufficient time interval is given rather than the application of too much heat. Slides were allowed to stand in a warm place, covered by a petri plate, for from forty minutes to three hours. Scrapings were found to vary greatly in regard to the ease with which the reagent affected them.

Sections of the biopsy specimens were made, as a rule, by the freezing microtome, since permanent preparations were not desired. However, when greater detail was desirable, the material was embedded and slides were prepared from the customary rotary microtome sections. This was not often necessary.

In the second series of cases studied, scrapings, cultures and biopsies were made in a selected group showing the clinical manifestations of ringworm. The treatment varied somewhat in the different cases, but after a clinical cure was obtained, a second biopsy was performed close to the site of the first one to determine if possible the presence or absence of spores or mycelia, active, dormant or dead. The second biopsy was taken at intervals of from two to ten months after the first.

REPORT OF CASES

Case 1.—Mr. M. S., aged 40, Armenian, a factory worker, had had recurrent attacks of tinea only on the hands for six years. Fungi were present microscopically; cultures showed *Trichophyton interdigitale* Priestly with *Aspergillus.* A biopsy of an active area revealed closely packed mycelia in the superficial layers only.

CASE 2.—Miss E. J., aged 14, a school girl, presented recurrent lesions of tinea on the hands and fingers. These had been present at intervals for eight years and were quite typical. On examination of the scrapings, mycelia and spores were found in large numbers; on culture, *T. interdigitale* was present together with *Oidium* and *Aspergillus,* the latter two probably being contaminants. In the biopsy, mycelia were found to be present in the superficial layers only (outer two to three layers).

CASE 3.—Mrs. S. R., aged 55, American, a janitress, had had constantly recurring lesions of tinea on the hands. Microscopically, there were mycelia and a few spores; cultures grew *T. interdigitale,* yeast and *Aspergillus;* biopsy showed a superficial involvement with scanty mycelia but large spores (yeast?).

CASE 4.—Mrs. E. P., aged 36, American, a janitress, had had a persistent patch of lesions on each palm which was clinically tinea. She also had a 4 plus Wassermann reaction. Microscopic examination and culture revealed a heavy infection of *Epidermophyton cruris* Castellani (*E. inguinale* Sabouraud). Biopsy showed a dense, deep involvement with mycelia, the penetration being six layers deep. The lesion was not syphilitic, either clinically or pathologically, yet treatment was unsuccessful until antisyphilitic measures were tried.

CASE 5.—Mr. C. S., aged 19, American, a printer, for three years had had typical recurrent tinea on the hands and feet. Scrapings showed only a slight amount of mycelia; cultures were positive for *Trichophyton,* probably *T. interdigitale.* Biopsy revealed atypical fungi, and a biopsy four months later from the same area (clinically cured) was negative.

CASE 6.—Mrs. A. B., aged 32, Polish, had had eczematoid dermatitis of the hands only for five years, recurring at intervals. Scales were positive, and a culture of *Trichophyton interdigitale* was grown. Biopsy was also positive for fungi.

CASE 7.—Mr. S. G., aged 33, Russian, a factory worker, had had patches of tinea on the palms and dorsa of the hands and fingers for three years. Typical tinea vesicles were present at each recurrence. Scales were positive for fungi resembling yeast or *Monilia;* culture showed only *Monilia* and scanty mycelia. Biopsy revealed spores in the outer layers only.

CASE 8.—Mr. F. S., aged 18, American, a theater usher, had had profuse eruptions of lesions on the hands and feet for two years with frequent recurrences. Scales and cultures were positive for fungi, *Aspergillus* being present as well as *E. cruris.* On biopsy, the mycelia were present only in the superficial layers of the epithelium. Local treatment without x-rays produced only temporary benefit.

CASE 9.—Mr. C. S., aged 18, American, had had eczema of the face and body for ten years, with exacerbations on the hands and feet typical of tinea. Vesicles and cultures were positive for fungi (*Epidermophyton* type) with large conidia. On biopsy, the fungi were found to be deeper in the epidermal layers than in any other case. A second biopsy three months later, while the hands were clinically cured, showed no fungus. The patient has since had exacerbations of the primary dermatitis but no recurrence of tinea.

CASE 10.—Mrs. B., aged 24, American, had had indefinite patches of dermatitis on the hands for four or five years. Atypical fungi were found in the scales, a culture showing *Trichophyton interdigitale.* Mycelia were present in the tissue in the superficial epidermis.

CASE 11.—P. W., aged 18, American, a school girl, had had two types of lesions on the neck, cubital areas and fingers for four years. The lesions on the

fingers were vesicular and clinically were typical tinea; the others were lichen simplex chronicus. During the past three years, recurrences of these two types of lesions have appeared, but not simultaneously.

Atypical fungi were found in the tops of the vesicles; *Epidermophyton* (*E. rubrum?*) was grown in culture and was found to be between the superficial layers of the epidermis. A second biopsy one year later, when no symptoms of tinea were present, revealed closely packed mycelia in the deeper layers, but no spores were found on repeated sectioning. It was suggested that the fungi, though present, were not viable. This observation is probably correct as the patient went through the summer of 1930 with no recurrence of lesions on the hands, although the lichen simplex chronicus had appeared at intervals.

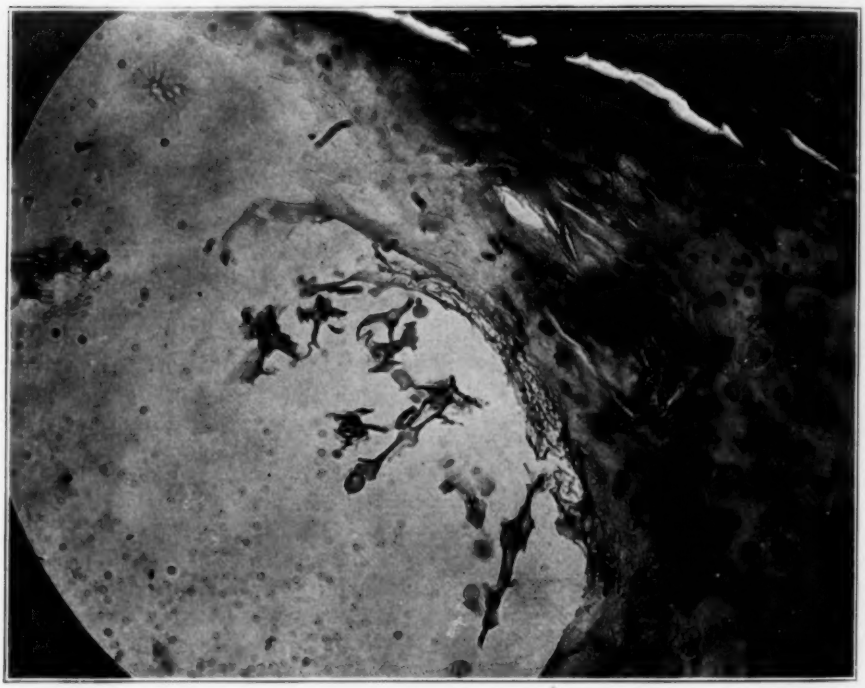

Fig. 1 (case 11).—Section of specimen obtained for first biopsy, showing atypical fungi in the top of the vesicle.

Case 12.—Mr. J. F., aged 20, American, a factory worker, had lesions for only three months on the feet. Typical *T. interdigitale* was found in the scales and on culture. In the tissue, the involvement was four or five layers deep.

Case 13.—Mr. T. H., aged 30, American, a student, presented a mild type of dermatophytosis on the hands only. This had been present at intervals for five years. Culture and scrapings were positive for *Epidermophyton*, the mycelia being found from three to four cells deep in the epidermal section.

Case 14.—Mr. M. B., aged 33, Italian, a factory worker, had had eczematoid dermatitis of the hands only for several years. *Epidermophyton* was present in the scales and on culture. Deep involvement of the epidermis (from six to eight cells deep) was found in the tissue, and fuseaux were present.

CASE 15.—Mr. A. F., aged 27, American, a clerk, had typical lesions of tinea on the hands and fingers for a number of years. Culture and scrapings were positive for fungi. Biopsy showed fragile organisms, possibly due to treatment. This case was particularly refractory to all treatment, and there were frequent relapses.

CASE 16.—Mr. H. K., aged 30, American, a traveler, presented typical lesions on the soles only which had been present for from five to six years. *Trichophyton interdigitale* was found on culture and in the scales. A few mycelial threads were found in the superficial layers of the epidermis on section.

CASE 17.—Mr. S. C., aged 41, American, a clerk, had had eczematoid dermatitis with small, deep, dried vesicles on the palms for many years. Fungi were found

Fig. 2 (case 11).—Section of specimen obtained for second biopsy one year later, showing mycelia still in the epidermis, but with no clinical manifestations.

in the scales, but the cultures were negative (due to treatment?). In the tissue fine mycelial threads were found abundantly, much deeper than usual (from eight to ten layers deep).

CASE 18.—Mr. V. H., aged 46, American, an electrical engineer, for fifteen years had had recurrences of dermatitis on the fingers only. Mycelia were found in the scrapings, but no culture was secured. Biopsy showed a superficial involvement of the epidermal layers by a scanty amount of mycelia.

CASE 19.—Miss G. H., aged 25, American, a clerk, presented a severe, acute outbreak on the palms and fingers. Recurrences had appeared for the past three years. Cultures showed *Trichophyton interdigitale;* scrapings were positive for spores only, and mycelia were found in the superficial epidermal layers. A second

biopsy seven months later was negative. Two months after the negative biopsy, there was an eruption of vesicular dermatitis, which was of the dyshidrotic type and was of short duration.

CASE 20.—Mr. J. W., aged 31, Russian, a tailor, for many years had had eczematoid lesions on the hands and feet. Cultures and scrapings were positive for fungi of the *Epidermophyton* group. On section, mycelia were found to be closely packed in the deeper layers of the epidermis (from six to eight cells deep). The patient had remained practically free from lesions on the hands and feet during the past two years.

CASE 21.—Mr. G. N., aged 52, American, a factory worker, for many years had had a recurrent eczematoid dermatitis of the hands, fingers and wrists. On

Fig. 3 (case 21).—Section of specimen obtained for first biopsy; mycelia were present.

microscopic examination, mycelia and spores were found, and *T. interdigitale* was grown in culture. In the tissue, mycelia were found superficially only. A second biopsy seven months later showed a deep involvement with scanty mycelia but no spores. As the patient was clinically cured, the fungus may not have been viable.

CASE 22.—Mr. E. E., aged 27, American, a factory worker, presented a subacute bullous vesicular dermatitis on the hands of six weeks' duration. Angular mycelia were found in the tops of the vesicles together with fuseaux. On culture, *Epidermophyton* (*E. perneti* Castellani?) was grown with chlamydospores. Closely packed mycelia were found only in the superficial layers of the epidermis. No spores were found.

CASE 23.—Mrs. M. P., aged 40, Polish, had had an acute dermatitis of the hands only for two weeks. A *Trichophyton* type of fungus was found in the scrapings with spores and a "ladder" mycelium, *T. interdigitale* and a green *Penicillium* being grown in culture. In the tissue, mycelia were abundant and deep. Spores were also found.

CASE 24.—Mrs. J. E., aged 48, American, a housewife, presented a typical, severe, bullous eruption of tinea of the hands and feet. Spores and a *Trichophyton* type of fungus were found in scrapings, no growth being reported from culture. On section, the mycelia were found to be abundant and quite deep (from six to ten cells deep). A second biopsy was made two months later with negative results. At that time the patient was clinically cured.

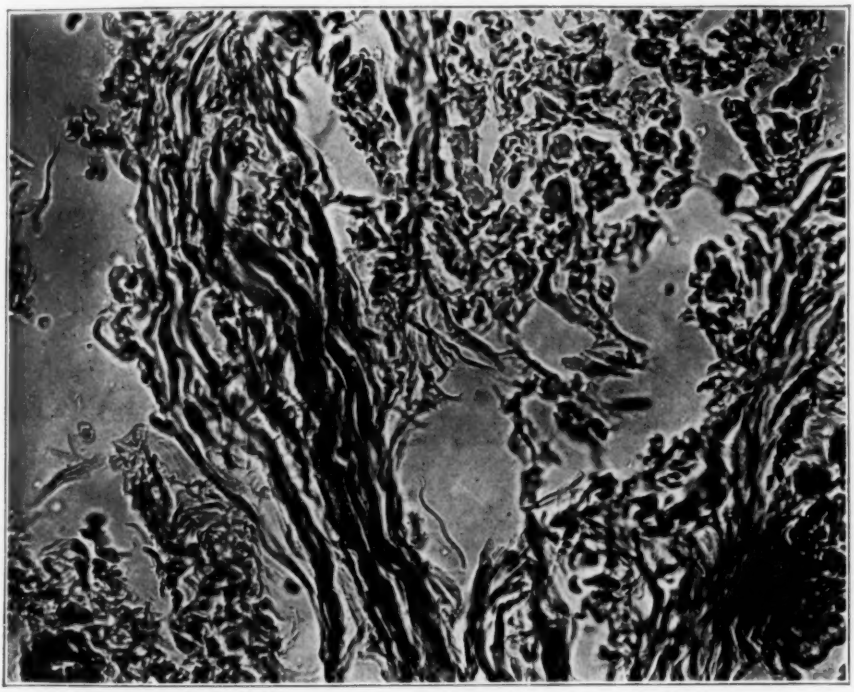

Fig. 4 (case 21).—Section of specimen obtained for second biopsy seven months later. There were no clinical symptoms, but scanty mycelia were present.

CASE 25.—Miss I. M., aged 25, American, a clerk, had had an acute bullous and vesicular dermatitis of a very severe type on the hands and the feet. This had been increasing in severity for several weeks and clinically was typical tinea. Microscopic examination of the vesicle top showed a fungus of apparently *Epidermophyton* type with spores and fuseaux, *T. interdigitale,* however, being obtained on culture. Biopsy showed a deep involvement (from six to ten cells) with abundant mycelia at the surface. A very rapid clinical cure also was obtained in this case.

CASE 26.—Mr. R. M., aged 47, a machinist foreman, had had tinea of the right index finger for several months. Microscopic examination of the scrapings was positive for fungus. In the tissue, involvement was found to be superficial, mycelia

with fuseaux being present. In a second biopsy four months later, one slide showed a slight amount of fungus; all others were negative. The patient had had a slight recurrence on the other fingers during the past year.

CASE 27.—Mr. W. H., aged 35, American, an agent, had a typical infection by fungus on several fingers, which was demonstrated in the scrapings. No biopsy was made until a clinical cure was obtained. At that time mycelia were not found, but later a recurrence occurred in other areas.

CASE 28.—Mr. W. B., aged 32, American, a salesman, had a definite eczematoid patch on the palms only, *Trichophyton* being found in the scrapings. Examination of the tissue, made after a clinical cure, was negative. To date no recurrence has been reported.

COMMENT

In this second series, the cases were selected as clinically tinea—not dermatophytid—and they presented all the symptoms of that disease. The diagnosis was confirmed microscopically in all cases, but culturally nine were negative. Of the remainder, twelve grew *Trichophyton,* eight *Epidermophyton,* one *Monilia* and one green *Penicillium.*

Of the 128 cases, 9 were clinically not tinea, and of the remaining 119, 31 were found to have the symptoms of tinea, but on culture developed *Aspergillus,* 7; *Monilia nigra,* 7; *Monilia alba,* 5; yeast, 4; "red yeast," 6; *Penicillium expansum,* 1; *Penicillium* bluish green, 1.

If this can be taken as a criterion, approximately 25 per cent of clinical ringworm is due to other fungi. The varied clinical therapeutic response would also tend to support this.

In the biopsies it was noted that mycelia were reported as deep or superficial. In analyzing the cases, it was found that mycelial invasion was reported deep (five or more layers) nine times and superficial fourteen times. Of the nine with deep involvement, two were mild and seven were severe infections; of the fourteen with superficial involvement, ten were mild cases and four were severe. This proportion would seem to indicate that the severity of the disease is directly proportional to the depth of tissue invasion.

In the question of recurrences, it was difficult to obtain data on many, recurrences being reported in eight. Of these, seven belonged to the group in which involvement was superficial. It was interesting to note also that in many of the cases in which the onset was severe and acute, the recovery was rapid, and recurrences have not been reported.

Deep involvement, therefore, does not necessarily forecast frequent or prolonged recurrences. Nor was it found that there was any relation between recurrences and the type of organism recovered.

In nine cases, biopsies were made after a clinical cure was obtained. In seven of these mycelia were not found, in two the mycelia were found to be deep-seated, whereas during the clinical activity of the disease the mycelia were superficial. In one of these two cases (case 11), the mycelia were reported as closely packed in the deeper

layers, but possibly not living. The second biopsy was made ten months after the first one. The hypothesis regarding the viability of the organism probably is correct as this patient has since then gone through the long, hot summer of 1930 with no recurrence.

In evaluating a biopsy as a criterion of cure, it would seem that if the results are negative the area examined is free from mycelia, but that organisms may be active or dormant in other areas. A clinical cure can mean that and nothing more, as organisms may still be present, potentially pathogenic or in such a low state of viability that they could be digested by the tissue cells.

As a positive culture was obtained from scales that had been dried for nine months, the fungus appears to be somewhat resistant to destruction.

A negative biopsy would naturally not preclude a reinfection in the area later, or the presence of a dermatophytid.

It is not our purpose in this paper to discuss the treatment for ringworm, but it would not be unreasonable to conclude that clinical cures by the present methods of treatment are obtained by raising the resistance of tissue, by change of soil and by lowering the viability of the organism, together with mechanical and chemical removal of the superficial epithelial layers.

The assumption appears to be justified that relapses may be due to reinfection from without or to renewed activity of dormant organisms in the epidermal layers, or that it may be a dermatophytid.

ABSTRACT OF DISCUSSION OF PAPER BY DRS. SCHAMBERG, BROWN AND HARKINS* AND THAT BY DRS. JAMIESON AND McCREA

DR. JEFFREY C. MICHAEL, Houston, Texas: What I have to say applies as well to Dr. Schamberg's paper as to this one. It is merely to cite some work of Marchionini (*Zentralbl. f. Haut- u. Geschlechtskr.* **32**:625, 1930), which throws a somewhat different light on the problem. Marchionini investigated the hydrogen ion concentration of the skin surface and found variations ranging from 3.5 to 5, except in the interspaces of the toe, where the hydrogen ion concentration varied about the neutral point (6.7 to 7.2). The latter concentrations are about the optimum for the growth of the Kaufmann-Wolf fungus, the common organism of epidermophytosis of the hands and feet.

Marchionini, as a result of these findings, tried treating his patients with acid fluids—0.4 per cent hydrochloric acid in alcohol. He said he got good results. Another practical point comes from this investigation, namely, the use of boric acid powder between the toes and on the feet as a preventive of recurrence and reinfection. Last week in Philadelphia, I talked to Dr. Sharlit about this, and he said that he also found boric acid good for this purpose. He recommended the addition of 5 per cent powdered starch to the boric acid as he found that this increased its efficacy.

DR. CHARLES M. WILLIAMS, New York: This work is very interesting, as is the reference to boric acid. I used that quite by accident. A patient came in the dispensary at a late hour, and as I had no time for laboratory work, I prescribed boric acid as a mild application and instructed the patient to return two

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days later. When she returned the improvement was very great. In the acute cases boric acid is more effective than any remedy I know of. I have not used it in chronic cases. There are some cases in which we cannot get results by any local application that I have been able to think of. The skin is irritable or the organism is deep-seated, or it is refractory, and in these cases I think we must seek some means of altering the resistance of the patient. Whether this is to be done by desensitization, by the intravenous use of iodine, or something else, I am not prepared to say.

This paper is very interesting and important as showing that the organisms may remain in the tissues for a considerable period of time, producing no symptoms whatever. That brings up the point of the criterion of cure. I do not know how thorough a cure was obtained in those cases, whether there was a little crack at the interdigital space or a slight scaling. The nails are often infected and are a source of reinfection. Another point was the finding of organisms reported by the authors. I note with pleasure that they stated that the fact that we do not find an organism does not mean that it is not there, but that it did not grow. They found Monilia of various kinds as the predominant organisms when Trichophyton was not found, and this I think may be the cause of many cases of interdigital intertrigo on the feet. This is something that needs further study and elucidation. I doubt whether Aspergillus or Penicillium ever causes infectious intertrigo; when these organisms are found, as is not infrequent, I have looked on them as contaminants.

Dr. Lloyd W. Ketron, Baltimore: I wish to ask Dr. Jamieson one question, particularly, concerning the depth in the skin at which he has been able to find the fungus and whether or not it can live in the cutis proper. This seems to me very important from the standpoint of therapy. We have innumerable agents that will destroy the organism, but reaching it is the most important question that now confronts us.

Dr. Samuel Ayres, Jr., Los Angeles: I have a feeling that one should not dismiss a patient with epidermophytosis until a microscopic examination fails to show the presence of fungi. Of course, in the light of the recent paper, even that is not a criterion of cure. We often see statements to the effect that the fungus cannot be demonstrated, or can be demonstrated with great difficulty, after the use of Whitfield's ointment. My experience does not agree with that. I think that the use of the microscopic examination is just as important in this disease in gaging results as the use of the Wassermann reaction is in syphilis. It has been my experience, after using the ointment for several weeks and finding nothing on the feet except a trifling amount of scaling, such as the ointment might have produced, to find large numbers of organisms in the scales. I think that we should establish the diagnosis microscopically in the first place and check it repeatedly. If we do not do this, we are apt to have repeated recurrences.

Another matter that I regard as important is to have the patient sterilize the floor by fumigating his bedroom with a formaldehyde candle, for this has been proved to be fungicidal. Shoes, slippers, socks and mats should be placed in the room.

In relation to Monilia, I have had two patients in the last two months with clinical symptoms of epidermophytosis of the feet in which Monilia albicans was found in culture, and by direct examination, and in both cases the toes were entirely spared, the organisms in both cases being found on the sole. There were moniliatids of the palms in which the organism was not present. I have had two cases of ringworm of the foot in both of which Penicillium was found by direct examination and by culture and in which no other organism was found. I cannot help feeling that in these cases Penicillium was the offending organism.

DR. HOWARD FOX, New York: In 25 per cent of their cases the authors found Aspergilli, Penicillia, yeasts and Monilia in cases of clinical dermatophytosis. They will agree, I am sure, that this does not definitely prove that they were the pathogenic agents. They might have been merely saprophytes occurring in various forms of dermatitis simulating ringworm.

Statements in a few cases are not quite clear. In case 4, do the authors think antisyphilitic treatment had an effect on the mycotic lesions? In case 7 mention was made of finding "Monilia and scanty mycelia." Did they mean Monilia plus some form of mold? This would not necessarily be implied as Monilia may also produce mycelia. In several cases "fuseaux" are reported as being found in tissues, which is certainly a rarity.

In regard to the term Trichophyton interdigitale, it would seem more appropriate to use the name Epidermophyton interdigitale as this species of fungus does not attack the hair.

In infection of the hands and feet due to fungi there are several reasons why we may fail to detect their presence by culture. Fungi may be absent in the particular scales examined, viability may be damaged by reaction of the tissues, and technical procedures may be at fault. In regard to the last point, many of us do not follow Sabouraud's advice that chemically pure materials such as maltose or dextrose are not as suitable for the growth of fungi as crude materials.

DR. W. H. GOECKERMAN, Rochester, Minn.: I think we all have the experience that when we use a certain preparation in a given case we get an excellent result, and in another case practically no result. It has been an experience with us that visiting physicians and colleagues will come in and say they have a superior remedy, and yet when we use that same remedy we do not get results. Then another man will say he has had no result with that particular remedy, but that he has a superior one. I should like to know whether the investigative work that has been referred to this morning will give a tangible explanation of this. If not, I think that particular thing should be kept in mind in the further study of the question of therapy. If the difference in response to a given drug is not determined by the variation in the species of the infecting organism, it is likely that the host's chemistry is of special importance.

DR. DAVID LIEBERTHAL, Chicago: I am led back a good many years, when we encountered conditions of this kind and micrologic studies had not been as extensive and intensive as in recent times. We had then cases that were classed under the names of dyshidrosis and pompholyx, most of which, undoubtedly, were cases of ringworm. We were taught to use in these exfoliants especially salicylic acid from 5 to 20 per cent in lead plaster or soap plaster which is made softer by melting with petrolatum. Good results were obtained. We are justified in assuming, as previously stated, that molds were the etiologic factor in these cases, and that the character of the molds has changed in the course of time.

The lesson we may draw from these two papers on ringworm, which support partially the clinical reasoning of our old teachers, is the following. In cases of ringworm we should apply exfoliants in order to remove the upper layers of the epidermis and with it the fungi, as Dr. Jamieson's findings suggest. This should be followed by the use of fungicides, which were found to be most effective in the experiments of Dr. Schamberg. In this manner we may be able to aid prophylaxis against recurrence of the disease in the same way that we aid in preventing transmission to others.

DR. GEORGE M. MACKEE, New York: Dr. Sharlit, in a very interesting contribution last week in Philadelphia, threw considerable doubt on the belief that the good result from salicylic acid is due entirely to its ability to cause exfoliation. If he places 1 per cent salicylic acid in a test tube, not mixed with

the culture, the fungi will not grow. He is not able to give any explanation for the phenomenon, but it seems there must be some action other than exfoliation.

One of the most practical points in connection with interdigital dermatophytosis is the prevention of recurrences. We have no remedy that will effect a permanent cure with certainty. We cannot prevent recurrences by using these remedies, or at least we have not been successful in so doing. Therefore, prophylaxis is important. The recurrences may be due to the inability of the fungicides to reach the bacteria, or they may be due to reinfection. The organisms seem to be everywhere, as we all know. Therefore, it would seem that we should use methods that are of prophylactic value. A paper on this subject was read at the recent session of the American Medical Association. The author recommended bathing or soaking the feet every day in a solution of sodium hyposulphite, or in a solution of sodium hyperchlorite, and also the use of boric acid dusting powders. For the last ten years I have been using a powder containing a high percentage of boracic acid, starch, talc and a little thymol. It has seemed to me that patients who have persistently used this powder have had fewer recurrences than those who have not used it.

Dr. J. Frank Schamberg, Philadelphia: Apropos of the discussion of Dr. MacKee, I would say that a 1 per cent salicylic acid is a strong concentration for a fungicide, in comparison with other preparations. When one recalls that oil of cinnamon, cloves and other things act in 1:1,000 to 1:5,000, one must realize that this is a very weak fungicide. I did not hear the paper of Dr. Sharlit last week, but it is difficult to understand how 1 per cent salicylic acid in a test tube could restrain the growth of the culture, without coming in contact with the fungus.

Dr. Earl D. Osborne, Buffalo: I was not going to mention the question of prophylaxis of ringworm of the feet, but I do think it is a very live subject. Dr. Schaffer spoke of this at the Philadelphia meeting last week and mentioned a method that we have been interested in for fifteen months. It was suggested to us that we test the fungicidal properties of sodium hypochlorite. I was unable to find any mention of the fungicidal properties of this chemical in the literature, although Schamberg and Kolmer, Kingery and Adkisson tested a great many different chemicals. We tested, in the laboratory, sodium hypochlorite in various dilutions and found that it was fungicidal in strengths of 0.15 per cent up to 0.5 per cent to all the commoner ringworm organisms found on the feet, including the most resistant of all, Trichophyton rosaceum. These tests were carried out with watery suspensions of the various organisms. Through the cooperation of the T. A. Patterson Laboratories of Cleveland, the Buffalo high schools were supplied with special rubber pans 2 feet square inside, and these pans were filled daily with fresh 0.5 per cent solution of sodium hypochlorite. More recently we have used 1 per cent solution in order to allow for a certain amount of dilution in the rubber pans. The students were required to walk through this solution before going to the showers or swimming pool and to pass their feet through the solution again just before putting on their clothes. In one high school a "well" or depression was built into the corridor floor, passing from the locker room to the shower baths so that all the pupils were compelled to walk through the solution. The pupils were carefully examined and questioned each month, and a sharp lookout was kept for any new cases of ringworm of the feet. Although we may have missed some, there was not a single case of ringworm of the feet reported this year in the high schools using this method of prophylaxis.

There was a recent article by Gould on the use of sodium thiosulphate. This chemical is not fungicidal under strengths of 5 per cent as shown by Schamberg

and Kolmer and which was recently confirmed by work in our laboratory. Furthermore, sodium thiosulphate unites with the sodium hypochlorite in the water of the swimming pool to form sodium chloride and sodium sulphate. The bacteriocidal property of the water in the swimming pool is thereby reduced, with subsequent danger from bacterial infection.

DR. ROBERT C. JAMIESON, Detroit: I wish to thank the members for their very generous discussion, and for the questions they have asked, many of which I cannot answer.

It was not the purpose of the paper to take up the question of treatment, but merely to give you the results of observations on the patients. I was glad to hear the good reports from the use of sodium hyposulphite. I have not had the good results that have been mentioned, but have had good results with the boric acid powder.

As to Dr. Ketron's question regarding the depth of the organism, I do not believe that in any of the biopsies the organisms were found in the cutis proper. There was something of a paradox in some cases. On the first biopsy the mycelia would be found in the cuticle layers, and on the second biopsy the organism had apparently retired to the deeper layers of the skin, but at no time was it found in the cutis proper.

Dr. Fox asked about case 4. That was a very interesting case, for we had not been successful with the ordinary methods of treatment until the patient was found to have a 4+ Wassermann reaction. After the institution of antisyphilitic therapy, the lesions healed. I think that is at least one answer to the question of why some patients do not get well on the ordinary methods of treatment. That is, there is some underlying factor in the patient that makes him very resistant to the usual methods of treatment. I think if we properly treat the underlying factor, the resistance to ringworm therapy is lowered and we can get good results. In case 7, Monilia were found in addition to the ordinary Trichophyton.

Dr. Goeckerman brought up the varied results in different cases on apparently the same treatment. I think the answer to that is the same as the answer to the question of Dr. Fox. We have different organisms producing the same clinical symptoms, and different persons have variable resistance, not only to the organism but to the methods of treatment employed.

I agree with Dr. Lieberthal that we need a certain amount of mechanical and chemical removal by exfoliation of some of the layers of the skin. This enables us to get down to the deeper layers, and also removes many of the organisms that are a source of infection. I think that as time goes on there is a change in the organism in ringworm, as there probably is a change in organisms of all sorts.

Dr. Highman mentioned a very valuable point in the care of patients with ringworm, and that is careful attention to the nails of the hands and feet. If all the clinical symptoms have subsided, we should use thorough scrubbing and perhaps mild fungicides in order to prevent transference of the organisms from the nails to various parts of the body.

Osborne mentioned the use of surgical solution of chlorinated soda (Dakin's solution), and I wish to say that we have seen several patients who have come in with severe dermatitis after self-treatment with this solution. If it is not used properly there is this danger. I think its use together with sodium thiosulphate is extremely satisfactory and valuable from the prophylactic angle. Prophylaxis in regard to transference of infection in the schools, swimming pools, etc., is an absolutely necessary question that we must face. We must try to prevent infection and reinfection in places where a large number of persons gather.

SARCOID ASSOCIATED WITH TUBERCULOSIS OF THE LARYNX

REPORT OF A CASE *

J. RICHARD ALLISON, M.D.
AND
P. V. MIKELL, M.D.
COLUMBIA, S. C.

A number of cases of sarcoid have been described in recent literature in which there seem to have been definite lesions of the same characteristics. Such cases have been classified as multiple benign sarcoid of Boeck and of Darier-Roussy by Finnerud, Goeckerman and others. Since Goeckerman's article with a review of the literature and report of seventeen cases was published, several other cases have been reported, including those of Daub and Menagh reported in the *American Journal of Roentgenology* and those of Kirkland and Morton, in the *Journal of Radiology*. While the findings in all cases have many of the characteristics of tuberculosis, the tuberculous origin has not been definitely proved. The following report of a case offers some additional, though not conclusive, evidence of the tuberculous origin of this condition.

REPORT OF A CASE

History.—A Negress, aged 34, complained of hoarseness, swelling of the fingers, difficulty in breathing and eruptions on the skin. The condition began about 1920, when a polypoid growth was removed from the left nostril, which promptly recurred and eventually resulted in a large perforation of the septum. Some time later, the patient became hoarse, at times losing her voice for periods of six weeks; this condition was usually accompanied by inspiratory dyspnea. In 1923, the tonsils were removed, and the throat was sore for two months after the operation. In 1925, the patient was suspected of having syphilis, although at the time this history was taken she believed that no positive evidence had been found. A total of twenty-one injections were given in the arms and hips, with some improvement in the general physical condition. About 1923, she first noticed the skin eruption, and a few months later the swelling of the fingers and toes. The skin eruption, a roughened area that gradually thickened and increased in size, first appeared on the face. The spots were confined to the face, ears, forearms and right leg, and there were never any subjective symptoms. The swelling, which was always painless had involved all the fingers and toes at some time since the illness

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started in 1923. At times near the nails of different fingers and toes there had been a discharge of pus which would continue for several months, and then the lesions would heal.

The patient's past history showed only slight headaches during menstruation. She wore glasses, and vision was good; she had had no trouble with the eyes or ears. The glands of the neck were enlarged, but were never painful. There had never been any cough, expectoration or pulmonary symptoms, and the patient did not know of any exposure to tuberculosis. Digestion had always been normal, and movement of bowels had been normal. The patient had one child living and well, and she had had one miscarriage ten years before. She had been gaining weight for the past five years.

Examination.—The patient walked into the office; she appeared well nourished and well developed. Mentally, she was clear and alert. The eyes and teeth

Fig. 1.—Large perforation of the septum.

appeared normal. There were a few small soft cervical glands. The chest as a whole moved poorly, resonance at both apexes being impaired. The breath sounds were faint and somewhat tubular, and were no doubt influenced by the condition of the larynx. No râles were heard. The heart was normal. The systolic blood pressure was 120 and the diastolic 80. The abdomen was normal, except that the right kidney and sigmoid were palpable. Vaginal examination showed a moderate perineal laceration, with a small cystocele and rectocele; the cervix was normal, and the uterus was retroverted. Rectal examination gave negative results. The reflexes were bilaterally equal and active. There were no gross sensory changes. The eyes were normal, with no evidence of iritis or keratitis. The vision was normal with correction, and examination of the ears gave negative results. The nose showed a very large ulcerating perforation of the septum, with many granulomas on each side obstructing normal breathing; large crusts were present. The tonsils had been removed, and there was a large amount of scar tissue. The pharynx was injected and showed a tendency to dryness. On depres-

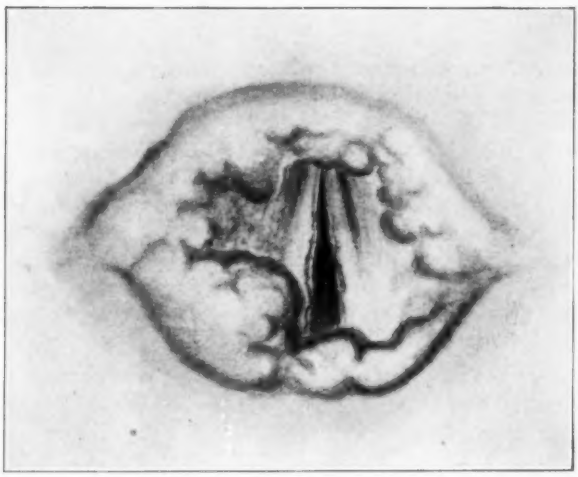

Fig. 2.—Deformity of the cords and the tumor mass that was removed for section.

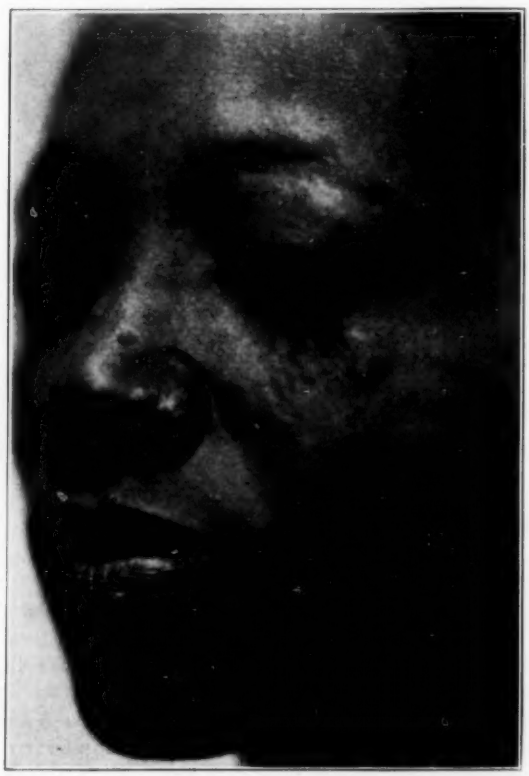

Fig. 3.—Sarcoid lesions on the cheek, nose and upper lip.

sion of the tongue, a sausage-shaped tumor of medium consistency involving the entire epiglottis presented itself. The tumor seemed to interfere with deglutition, and it caused inspiratory dyspnea. The entire epiglottis with the tumor was removed on May 9, 1928. The arytenoids on both sides were enlarged; the cords were thickened, and there were small indurated growths on each. There was no ulceration, but coaptation was very imperfect.

The skin showed several lesions that seemed to be typical of those described for this type of sarcoid. On the left cheek there was a lesion 3 cm. in diameter, well circumscribed, slightly elevated, nodular, deeply pigmented and slightly wrinkled, especially toward the borders. The central portion showed a tendency to scale, and there were areas between the elevations that were scarlike, atrophic and slightly depigmented. On the opposite side of the nose was a similar lesion 2 cm. in diameter. The lower lobe of each ear showed nodular, atrophic, destructive, slightly scaly, deeply pigmented lesions. On the upper lip there was a pea-sized, circumscribed, elevated, scaly lesion. On both arms and both anterior tibial surfaces similar lesions were found. All lesions were freely movable and were not attached to the deeper structures. The older lesions showed more atrophy and scar formation, with a tendency to depigmentation about the center. There was no evidence or history of ulceration in any of the skin lesions. Both index fingers showed swelling and deformity of the distal phalanx; the swelling was soft, nodular and painless. The nails of the index fingers and of the first two toes of the right foot were partially destroyed, and showed evidence of old discharging areas at the base of the nails.

Roentgen Examination.—The roentgen report was made by Dr. F. D. Rogers. Pictures of practically the entire bony framework were made, with negative findings, except in the following bones: on the left hand the first and second phalanges of the thumb and the index finger, the first phalanx of the middle finger and the second phalanx of the little finger; on the right hand, the first phalanx of the thumb; the first and second phalanges of the index and middle fingers and the third phalanx of the ring finger; on the right foot, the great toe, the second phalanx of the second toe and the lower end of the fibula; on the left foot, the first phalanx of the great toe, the second phalanx of the little toe and the fifth metatarsal bone. The bone lesions were more pronounced in the phalanges, metacarpal and metatarsal bones. The process was apparently a destructive one, with absorption of lime salts in definite areas that resembled multiple cysts. The joints were not involved, the articular surfaces being smooth and clear. The chest showed a very faint infiltration in the left apex. Hilar shadows were massive. The left diaphragmatic shadow was normal, but the right diaphragmatic shadow appeared to be adherent at the periphery. The findings were suggestive of very mild tuberculosis. The epiglottis was entirely missing.

Microscopic Examination.—The following is the report of Dr. Lynch on sections from the larynx, the skin surface of the nose and the lobe of the ear. A microscopic study of sections from these three tissues revealed identical lesions made up of agglomerations of typical anatomic tubercles, rounded, with the central and main body constructed of connective tissue epithelioids, with an occasional eccentrically located tubercle foreign body giant cell and a peripheral zone definitely circumscribed from the surrounding tissues. The center of some was necrotic and caseous. The histologic diagnosis was tuberculosis. Several sections from the lobe of the ear failed to reveal tubercle bacilli by special stain. A guinea-pig inoculated with an emulsion of fresh tissue from the ear, on March 18, 1931, was of healthy appearance at the time this paper was written.

Fig. 4.—Swelling of the fingers and old healed lesions at the base of the finger-nails.

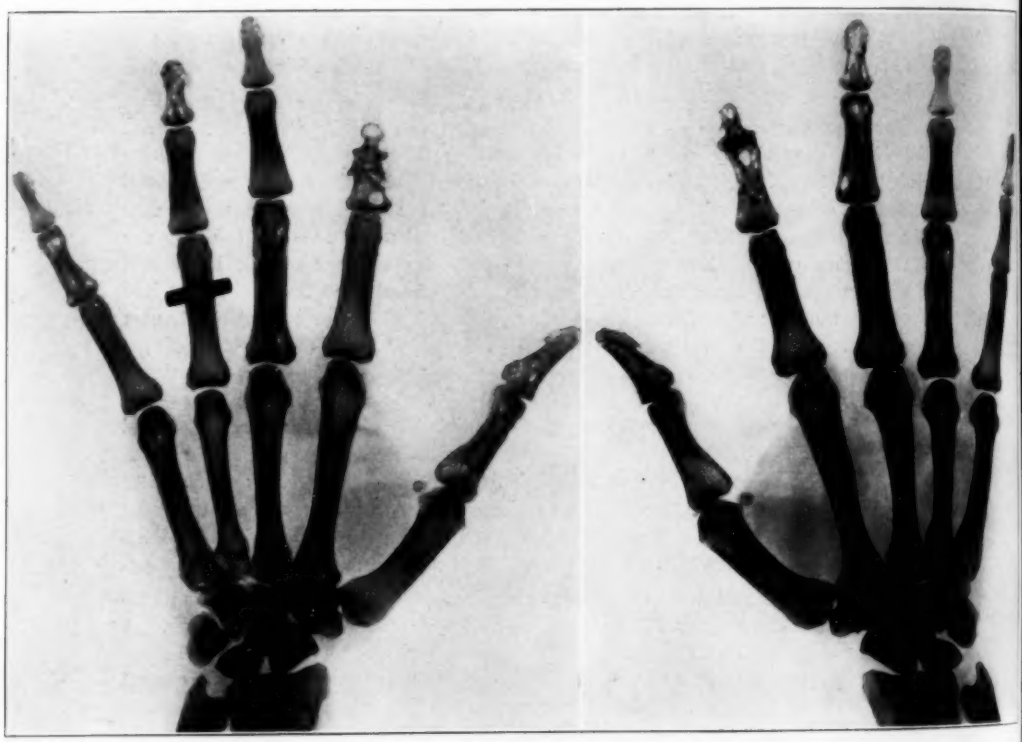

Fig. 5.—Absorption of bone in the left and right hand.

Fig. 6.—Absorption of bone in the left and right foot.

Fig. 7.—Section of the larynx showing typical tuberculous caseation; magnification reduced one-half.

Fig. 8.—Section from the skin of the cheek, showing typical tuberculous structure; magnification reduced one-half.

The following is a report of Dr. Plowden on a section from the septum of the nose. Microscopic sections showed fairly typical miliary tuberculosis, with very early caseation and the formation of a few fairly typical giant cells of the Langhans type. In addition to the tuberculous process, there was quite evident edema of the tissue. The diagnosis was tuberculosis.

Laboratory Examination.—The Wassermann reaction of the blood and the urinalysis were negative. Examination of the blood showed: no abnormal cells;

Fig. 9.—Section from the lobe of the ear of a lesion only three weeks old showing very early tuberculous changes; magnification reduced one-half.

hemoglobin, 70 per cent; red blood cells, 4,125,000; leukocytes, 5,800; polymorphonuclears, 60 per cent, and small mononuclears, 39 per cent. Examination of the sputum was negative for tubercle bacilli, several examinations being made on a twenty-four hour specimen. Examination of the stools gave negative results, and no tubercles were found. The tuberculin reaction was negative locally, and no systemic disturbance was noted.

Treatment.—As stated in the history, the patient had been given twenty-one injections in the arms and hips for suspected syphilis in 1925. In 1929, she received twelve doses of neoarsphenamine. During the five years preceding 1931, she received numerous general and local treatments with quartz lights, together with local roentgen treatment to the skin lesions. The general health and nutrition were good, and it would seem that she had improved steadily during the past five years. It is believed that the arsenic and light therapy were efficacious in this case.

CONCLUSION

A case of multiple benign sarcoid of Boeck and of Darier-Roussy following primary tuberculosis of the throat is reported. This case is typical of many already reported, and is offered as additional proof of the tuberculous origin of such cases.

ABSTRACT OF DISCUSSION

Dr. Paul A. O'Leary, Rochester, Minn.: I believe that it is difficult to draw a line of demarcation between sarcoid, lupus pernio and Wende's tuberculosis of the hypoderm. This is true not only clinically but histologically. In spite of the fact that there is a typical picture of sarcoid, we must look on the condition as a phase in the transitional picture of cutaneous tuberculosis. There are still a few dermatologists who do not accept sarcoid as a manifestation of cutaneous tuberculosis, and I believe contributions of this type are of value in attempting to crystallize further the opinion of what is, in this country at least, an accepted fact. Dr. Allison's report emphasizes the importance of scrutinizing carefully the chest in patients with sarcoid, as other reports have shown that the pulmonary lesions are akin to those on the skin. I do not believe that we should look on osteoporosis as a specific accompaniment of sarcoid, for similar bony changes are seen in association with other nontuberculous diseases.

Contributions of this type are of great value in the attempt to establish further the tuberculous etiology of sarcoid.

Dr. Jack W. Jones, Atlanta, Ga.: I have always been greatly interested in papers on variations of tuberculosis, and there have been many from the south. I wish to mention one observation that we have made in our section of the country. Although lupus erythematosus and various tuberculids are not uncommon during tuberculosis of the skin, lupus vulgaris in our section of the country is almost unknown. With a fairly large clinical practice and a fairly large private practice, I think I have observed three cases of actually proved tuberculosis of the skin. I was in the United States Public Health Hospital at Oteen a short time ago, and the officer in charge told me that there tuberculosis of the skin is practically unknown. I remember that Dr. Hutchins, who is now dead, said he had observed during his life time probably two cases of tuberculosis of the skin. I am unable to account for it, unless our much advertised sunlight has something to do with it.

Dr. Michael H. Ebert, Chicago: I was particularly interested in this case report, because I have shown several cases of sarcoid at the meetings of the Chicago Dermatological Society, and have been much interested in this disease. The sarcoid reaction, I think, is generally recognized as simply a type of tissue reaction to a bacillus, and it may in fact be a reaction to a spirochete, because there are sarcoid-like tumors that are due to syphilis, and there certainly is a clinical sarcoid due to leprosy.

I think this case is particularly interesting from the biologic point of view, for, if I understood the presenter correctly, the sarcoid-like lesions on the skin were preceded by the other condition. Kyrle stated that tubercle bacilli could be numerous and could produce lesions on the skin as the result of their distribution through the blood stream, usually causing a banal type of inflammatory reaction, and that later the lesions change into the sarcoid type, and the bacilli disappear. I think this is a similar case. At one time the infection was so severe as to be destructive. I have no doubt that at that time the bacilli were present, but that at the time of the sarcoid formation they were absent.

DR. J. RICHARD ALLISON, Columbia, S. C.: The point Dr. Ebert brought out regarding the tuberculous process is interesting. I believe the patient's tuberculosis was cured in 1923, at the time of the operation on the nose and throat, but the skin lesions did not appear until 1925. The whole question rests on the primary infection in the nose and throat, with the sarcoid lesions following it later.

LVIII.—MULTIPLE DISSEMINATED ANGIOMAS

REPORT OF A CASE *

C. J. LUNSFORD, M.D.
OAKLAND, CALIF.

REPORT OF CASE

History.—E. R., a girl, aged 3 months, was admitted to the Barnard Free Skin and Cancer Hospital on Sept. 15, 1924, with multiple angiomas disseminated over the entire body. The history as given by her mother was as follows: The patient had an uneventful delivery and at birth showed no evidence of abnormality. She was the fourth child, the others being normal, healthy children. At the age of 6 days several red spots about the size of a pinhead were noticed on the front of the chest. These gradually increased in size. During the following weeks similar lesions appeared scattered over the entire body. At the time of presentation there had been no evidence of subjective symptoms and no history of bleeding.

Examination.—The patient was a well developed and well nourished infant. She showed no abnormalities, except the following cutaneous condition (fig. 1). Scattered over the entire body, including the trunk, extremities, face, scalp and oral mucous membrane, were sharply circumscribed, slightly raised red lesions of various shapes and varying in size from that of a pinhead to that of a dime. Most of the lesions were circular or oval, while others were distinctly irregular. The smaller ones were pink and the larger ones dark red. There was no evidence of rupture. The lesions had a soft velvety feel and all faded on pressure. The body was divided into suitable areas in order to facilitate the counting of the lesions and the following results were obtained:

Left side of scalp	62
Left side of face	23
Left side of neck	25
Left anterior part of chest	41
Left anterior part of abdomen	22
Left upper extremity	102
Left side of back	53
Left lower extremity	89
Total on left side of body	417
Total on entire body (approximated)	834

The laboratory report on the blood by Dr. George Ives showed nothing abnormal.

Histopathology.—One of the lesions on the anterior abdominal wall was excised. The following report of the microscopic examination was made by Dr. Louis Jorstad (fig. 2): The specimen was from the skin. The epidermis was normal.

* Submitted for publication, June 27, 1931.

* Studies, observations and reports from the Dermatological Departments of the Barnard Free Skin and Cancer Hospital, and the School of Medicine, Washington University, St. Louis, Mo., U. S. A., service of Drs. M. F. Engman and W. H. Mook.

The subcutaneous tissue was normal, except in an area of practically the diameter of the low power field; in this area there were numerous thin-walled spaces. Under high power magnification, these spaces were observed to be lined with endothelium, and within some of them were red blood cells and white blood cells. This area extended up to the dermis, and in some portions it was rather irregular in outline. There was slight round cell infiltration about it, as well as between the vessels in the area. The microscopic diagnosis was hemangioma.

Treatment.—Owing to the large number of lesions, it was decided to use both radium and carbon dioxide snow.

Two large lesions were selected for the application of radium, one on the left cheek and one on the left anterior costal margin. Each received 50 mg.

Fig. 1.—Multiple disseminated angiomas before treatment.

hours of radium in the form of two 12.5 mg. needles applied for two hours at a distance of 0.5 cm. and filtered with 0.4 mm. of lead and a thin sheet of rubber.

The upper extremities were selected as a suitable place for beginning the treatment with carbon dioxide snow. The preparation was applied in the form of a pencil. The pressure exerted was little more than that of the weight of the pencil. Six lesions were treated at each sitting. The time of application at first was from ten to forty seconds, depending on the size of the lesion. Subsequent observation led us to make all future application for from twenty to thirty seconds. In the course of a few months more than two hundred angiomas on the scalp, face, neck, upper extremities and trunk were treated with carbon dioxide snow.

Observation of the lesions treated with radium, three months after application, revealed a partial fading of their color. The fading gradually progressed until at the end of six months the lesions were about one third of their original size. The impracticability of the radium treatment on account of the inconvenience of its application and the time consumed, together with the number of lesions present, led us to discontinue its use and to rely entirely on the application of carbon dioxide snow.

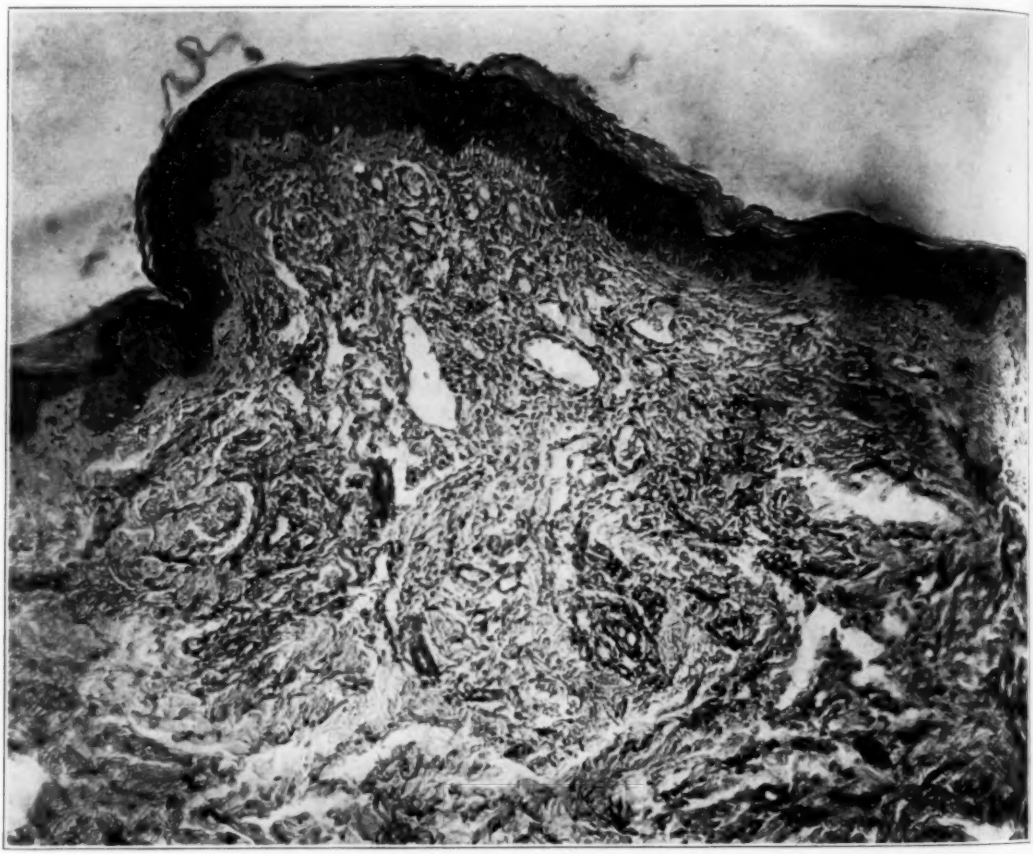

Fig. 2.—Photomicrograph of an angioma showing multiple dilated vascular spaces in the corium.

The following observations were made of the results of the applications of carbon dioxide snow: The ten second applications had no effect. The forty second applications produced blistering in from ten minutes to twenty-four hours. The resulting superficial ulcers healed without scars. The best results were obtained from the twenty to thirty second applications of carbon dioxide snow. These produced vesicles in from twenty-four to forty-eight hours, which in no case became infected. They healed without treatment and did not produce scars. The lesions disappeared in from ten to fourteen days, leaving faint yellow stains which gradually faded to depigmented spot and later were barely distinguishable

from the surrounding normal skin. Rarely was it necessary to repeat the treatment. In no instance was there failure.

The case was presented before the St. Louis Dermatological Society and was recorded in the ARCHIVES OF DERMATOLOGY AND SYPHILOGY (**15**:635 [May] 1927) for the purpose of showing the results of treatment. The interesting point was brought out that practically all of the untreated lesions showed a gradual decrease in size and color subsequent to the disappearance of the treated lesions.

On March 27, 1928, the patient was again examined, about three years after treatment was stopped. The skin of the head and limbs showed no abnormality,

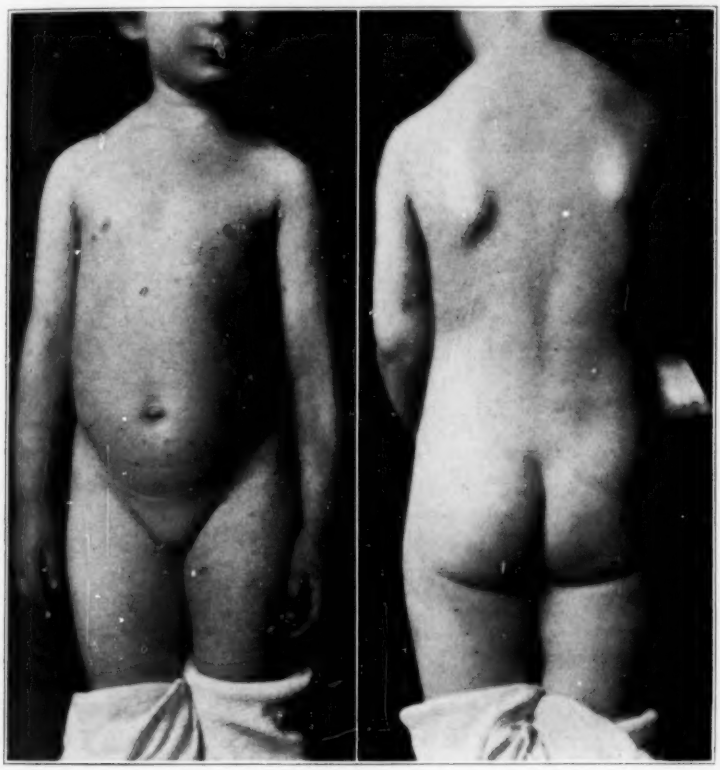

Fig. 3.—Photographs taken three years after treatment for multiple disseminated angiomas.

except that on close inspection a few slight scars with a very faint tinge of color could be seen. The lesions on the torso were slowly retrogressing and were flattened until only the larger ones were faintly visible (fig. 3).

SUMMARY

A case of multiple angiomas in a baby is described in which approximately 834 lesions were present. The lesions were successfully treated with carbon dioxide snow. The application of radium is impracticable in the presence of so great a number of lesions.

FUNGISTASIS IN RINGWORM OF THE TOES AND OF THE FEET

II. TWO PER CENT MERCUROCHROME-220 SOLUBLE AND LIQUOR HEXYLRESORCINOLIS 1:1000 (ST37)*

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The selection of 2 per cent aqueous solution of mercurochrome-220 soluble for this study was made because of its frequent use by the laity in ringworm of the toes and of the feet, and because of its recommendation by physicians in several recent articles as being beneficial in such cases.

The choice of liquor hexylresorcinolis 1:1,000 (ST37) for a fungistatic study was made because of its asserted high bactericidal power and because of its derivation from resorcinol, which is commonly used in dermatologic conditions. Resorcinol is a diatomic phenol, metadihydroxybenzene ($C_6H_4(OH)_2$).

According to Sollmann,[1] the power of benzene (C_6H_6) to react with protoplasm is given by replacing some of its hydrogen atoms by other groups, especially by the hydroxyl (OH) group, thus forming phenol and polyatomic phenols. Hexylresorcinol, having two hydroxyl groups, should theoretically be a more powerful antiseptic than salicylic acid, which has only one hydroxyl group and a carboxyl (COOH) group. Salicylic acid was shown in our previous study to be of fungistatic value.[2]

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* Submitted for publication, May 20, 1931.

* This study was made with the aid of a grant from the Ward Fund of Cornell University.

1. Sollmann: Textbook of Pharmacology, Philadelphia, W. B. Saunders Company, 1906, p. 357.

2. Gould, A. G., and Carter, E. K.: Fungistasis in Ringworm of the Toes and of the Feet: 1. Salicylic and Benzoic Acids, Arch. Dermat. & Syph. **22**:225 (Aug.) 1930.

The formula for hexylresorcinol is as follows:

$$(OH)_2C_6H_3(CH_2.CH_2.CH_2.CH_2.CH_2.CH_3)$$

Feirer and Leonard [3] have shown that as the number of carbon atoms in the alkyl chain is increased up to six, the resulting compounds (propylresorcinol, butylresorcinol, amylresorcinol and hexylresorcinol) show an enormous increase in germicidal power. They found the increase in germicidal power of these successive compounds to be directly proportional to the sum of the atomic weights of the atoms of the alkyl chain. The same investigators found that hexylresorcinol showed "an increase in germicidal power over that of resorcinol, its mother substance, of

TABLE 1.—*Fungistatic Results of Dilutions of Liquor Hexylresorcinolis 1: 1,000 (ST37) on Three Common Trichophytons of the Toes and the Foot* *

	Subcultures‡				
Dilutions†	1043 T. interdigitale	1611 T. pedis	New 1850 T. interdigitale	1869 T. interdigitale	1851 T. purpureum
1:300.....	+	+	+	+	+
1:200.....	+	+	+	+	+
1:150.....	+	+	+	+	+
1:120.....	+	+	+	+	+
1:60.....	+	+	+	+	+
1:40.....	+	+	+	+	+
1:30.....	0	0	0	+	0
1:15.....	0	0	0	0	0
1:10.....	0	0	0	0	0

* Dr. Fred D. Weidman and Miss D. Spring of the Laboratory of Dermatological Research, University of Pennsylvania, furnished the original cultures from which subcultures were made. In the tables 0 indicates no growth; +, growth, and ±, that in some tubes of this strength growth occurred and that in others of the same strength it did not.

† It is to be remembered that these are dilutions of an original 1:1,000 solution, so that a dilution of 1:30 in the table, for example, really represents a solution of liquor hexylresorcinolis of 1:30,000.

‡ The subcultures were isolated from a human source as follows: 1043, about September, 1927; 1611, on Dec. 28, 1926; new 1850, late in 1929; 1869, on July 23, 1928, and 1851, on May 14, 1928. Growth was obtained in all control tubes.

over twenty thousand per cent (20,000 per cent) without any increase in toxicity or irritant properties." [4] The substitution of the hexyl group for a hydrogen atom of resorcinol, to form hexylresorcinol therefore enhances tremendously the antiseptic property of resorcinol. We might also anticipate an increased fungistatic power by analogy.

The value of the low surface tension of liquor hexylresorcinolis 1:1000 as a bacteriostat and bactericide has been the subject of much study. It is doubtful whether the quantities of liquor hexylresorcinolis

3. Feirer, W. A., and Leonard, V.: Hexylresorcinol in Oral Antisepsis with Special Reference to Solution S. T. 37, Dental Cosmos **69**:882 (Sept.) 1927.

4. Leonard, V., and Feirer, W. A.: Hexylresorcinol as a General Antiseptic, Surg., Gynec. & Obst. **45**:603 (Nov.) 1927.

1 : 1000 used in the present fungistatic study were sufficient to make the low surface tension a factor of importance. Whatever fungistatic power the solution showed in this study was probably due to its chemical antiseptic power and not to its surface tension of 37 dynes per centimeter.

THE FUNGISTATIC ACTION OF LIQUOR HEXYLRESORCINOLIS 1: 1000 (ST37)

The technic of this study followed very closely that of our study of salicylic and benzoic acids as fungistats.[2] The reader is therefore referred to the original article for the methods of preparation of the medium containing the liquor hexylresorcinolis 1 : 1000 and for the details of the subsequent fungus implantations and their study.

TABLE 2.—*Fungistatic Results of Dilutions of 2 Per Cent Mercurochrome-220 Soluble on Three Common Trichophytons of the Toes and the Foot*

	Subcultures†					
Dilution*	1043 T. interdigitale	1611 T. pedis	New 1850 T. interdigitale	1869 T. interdigitale	1851 T. purpureum	New 1550 T. purpureum
1:200	+	+	+	+	+	+
1:150	+	+	+	+	+	+
1:120	+	+	+	+	+	+
1:60	+	+	+	+	+	±
1:40	+	+	+	+	+	+
1:30	+	+	+	±	+	+
1:24	+	+	+	+	+	+
1:20	+	+	+	+	+	+
1:17+	+	+	+	+	+	+
1:15	+	+	+	+	+	±
1:13+	+	+	+	+	+	±
1:12	+	+	+	+	+	±

* These are dilutions of a 2 per cent solution, so that a dilution of 1:12 in the table, for instance, actually represents a solution of 1:600 mercurochrome-220 soluble.
† New subculture 1550 was isolated from a human source on Feb. 5, 1929.

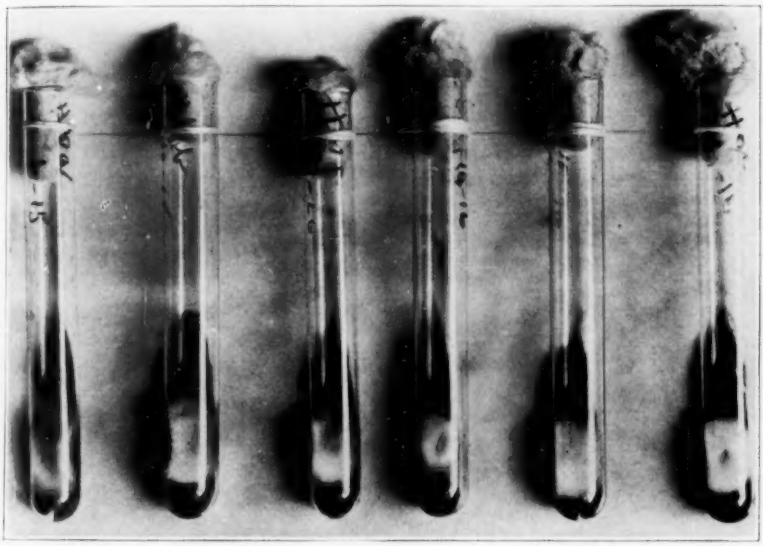
In table 1 may be found the growth-restraining effects of the solution on five strains of three common trichophytons of the toes and the foot.

THE FUNGISTATIC ACTION OF TWO PER CENT AQUEOUS SOLUTION MERCUROCHROME-220 SOLUBLE

The technic of this study was the same as that for liquor hexylresorcinolis 1 : 1000 (ST37). The results are indicated in table 2. A photograph of one of the series of inoculated tubes is also shown.

Mercurochrome is disodium-dibrom-oxymercuri-fluorescein. Fluorescein, the basic substance of mercurochrome, is produced by heating together phthalic anhydride and resorcinol. Thus fluorescein, although an important dyestuff, because of its derivation from resorcinol has

possibilities as an antiseptic. Its conversion into mercurochrome consists of brominating, mercurating and converting the resulting insoluble form into the disodium salt.[5] Dunning [5] stated that any hydrogen ion concentration greater than p_H 4.8 causes immediate precipitation of the mercurochrome. The Pennsylvania medium used in this study had a p_H of 4.75 by the electrolytic method. No precipitation of the mercurochrome was observed in any of the tubes of medium. The solution of mercurochrome used in this study was prepared freshly from tablets of mercurochrome, though numerous studies have shown that mercurochrome does not readily deteriorate.



Three common trichophytons of the toes and the foot growing on Pennsylvania medium containing one part of 2 per cent solution of mercurochrome-220 soluble to twelve parts of medium (one-twelfth dilution of 2 per cent or 1 : 600 mercurochrome-220 soluble). From left to right the trichophytons are 1043 T. interdigitale, 1611 T. pedis, new 1850 T. interdigitale, 1869 T. interdigitale, 1851 T. purpureum, and new 1550 T. purpureum.

CONCLUSIONS

1. Mercurochrome-220 soluble and liquor hexylresorcinolis are derivatives of resorcinol. Therefore, theoretically they should be good antiseptics.

2. Liquor hexylresorcinolis theoretically ought to be a more powerful fungistat than salicylic acid. Practically, however, they are of about

5. Dunning, F.: Mercurochrome, Am. Druggist, August, 1929.

equal value as fungistats, both being active growth-restraining substances in approximately 1 : 30,000 solution.

3. Mercurochrome-220 soluble is not a powerful fungistat. Three common trichophytons of the toes and the foot grew luxuriantly in the presence of 1 : 600 solution. Stronger solutions than 1 : 600 were not studied, as weaker solutions of other substances have been shown to be more powerful fungistatic agents.

LUPUS ERYTHEMATOSUS SUBACUTUS WITH AN UNUSUAL BLOOD PICTURE

A CLINICAL STUDY *

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Fatal results in patients with lupus erythematosus acutus and subacutus occur with great enough frequency that extreme care is being exercised by most dermatologists in its management. Especially since the search for foci of infection has been made a routine in the study of patients, and the elimination has been undertaken as a therapeutic procedure, a fair number of such fatalities has come to the notice of one of us (Dr. Hollander). Most frequently such operative procedure as tonsillectomy seems to disseminate a lethal dose of infective agents, and death ensues in a few weeks.

This report deals with a clinical study of a patient belonging to this category, and it seems to establish at least one of the possible causes for these fatalities; it also points out that extreme caution must be exercised in the management of these patients in order not to overtax their ability of resistance, which is already at a low level.

This speaks as much of major medical as it does of major or minor surgical intervention.

REPORT OF A CASE

History.—Mrs. E. H., aged 36, American born, a housewife, presented herself for an examination on March 12, 1930, on account of an eruption of four months' duration, which affected her face, neck, chest, arms and the mucous membranes of her oral cavity.

The diagnosis of lupus erythematosus subacutus of the skin and mouth was made on the following characteristics:

A symmetrical maculopapular scaly eruption was present on an inflamed skin surface. The individual lesions were rounded and irregularly shaped, discrete and confluent to form various sized plaques. The scales were markedly adherent. Superficial atrophy and telangiectasia were present.

Practically the entire surface of the oral mucosa was involved with a pinpoint and linear bluish-white eruption composed of thickened epithelium. At the buccal

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* From the Department of Dermatology of the Pittsburgh Skin and Cancer Foundation.

mucosa on either side there was a necrotic area covered by an adherent pyogenic membrane. The eruption proved to be extremely chronic. Subjective symptoms were mild. On the dorsal surface of the tongue two linear areas of atrophy were also present.

Medical Impression on Admission.—In addition to the dermatologic diagnosis, the following general conditions seemed of importance: (1) oral infection, (*a*) dental abscesses, (*b*) diseased tonsils; (2) hyperthyroidism, which was suggested by the enlarged thyroid gland and manifested nervous tendency (not corroborated by basal metabolic findings) and (3) a low white blood cell count with an increase

Fig. 1.—Involvement on first examination.

in monocytes. The count, which was confirmed by repeated examination, was considered of great interest. This type of cellular reaction appeared possibly to be a response to a tuberculous infection.

Clinical Course.—The presence of the unusual blood picture in the patient was considered important from the first. Blood examinations were made almost daily. All blood counts were checked three times, the Bureau of Standards instruments being used. Five hundred to 1,000 cells were counted in differential counts. Peroxidase stains were done every two weeks. During the course of the disease ninety-six complete blood counts were done. Figure 2 represents the course followed by the red cells, hemoglobin, color index and blood platelets. Figure 3 represents the total white cell counts, and in addition the actual number of the

three type cells are recorded. In this chart the actual number of neutrophils is taken as 5,000, lymphocytes 2,000 and monocytes 500. We believe the actual number of cells represents the response of each type of white cell more accurately than the differential percentage and the total counts separately. It will be seen that with the low white cell count, although the percentage of monocytes was increased in differential count, the actual number of these cells was normal. The actual number of neutrophils and lymphocytes was greatly decreased.

Twelve days after admission (March 24), the blood examination revealed a startling change. The white blood count remained low, while the neutrophils increased in number; an Arneth shift to the left was seen, and premature cells appeared as myelocytes, 9.5 per cent. The monocytes decreased in number, and the lymphocytes increased slightly. At this time the red cell count remained unchanged but some red cells were polychromatophilic and stippled. From this

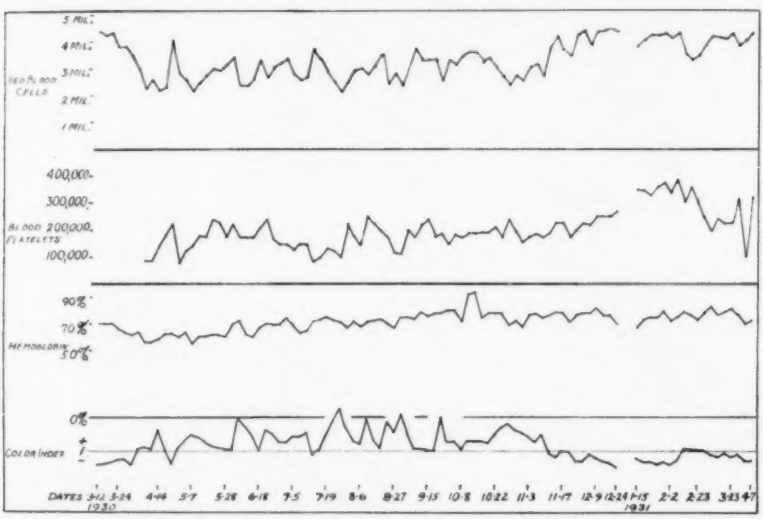

Fig. 2.—Comparison of the red blood cells, hemoglobin and platelets.

period the white cell count varied from 2,800 to 5,800 per cubic millimeter, and immature and premature granular cells, as myelocytes, were present from 3 to 9 per cent. The abnormal white cells were studied with the peroxidase stain. Cells classified as myelocytes were peroxidase-positive. Occasional large cells with pale-staining, oval nuclei and clear grayish-blue cytoplasm were peroxidase-negative. These cells resembled monocytes (endothelial cells) or lymphoblasts. After repeated examination by Wright's stain, they were usually found to contain a few neutrophilic granules, and we believe they represented early peroxidase negative myeloblasts.

Beginning with the change in white cell morphology, the red cell count steadily fell within one week to 3,510,000. Morphologically, the red cells showed a marked polychromatophilia and anisocytosis. Macrocytes were not plentiful, and the color index was 0.8. The skin and mucous membrane lesions remained the same.

Because of the increasing anemia, the patient was given a diet of liver, rare beef, glandular foods and fresh vegetables. Liver was taken in adequate amount, 2 pounds of calf's liver per week, and 4 ampules of liver extract 343

(Lilly) per day. Within two weeks, despite the liver and dietary therapy, the red cell count continued to decrease to 2,230,000 per cubic millimeter. Nucleated red cells were occasionally seen. There was great variation in the chromatin content and size of the cells, but only a few macrocytes were present. The color index became greater than 1, and the blood platelets varied from 88,000 to 130,000 per cubic millimeter. There was no increase in reticulocytes during this period, the percentage remaining about 0.23 per cent. The low white cell count and presence of immature and premature granulocytes remained unchanged. A thorough clinical and roentgen study revealed no evidence of a tuberculous infection. There was no lymph gland enlargement, and the spleen was not palpable. The icterus index was normal. Biopsy of the skin lesion showed a type of chronic inflammation, unlike tuberculosis, leukemia or Hodgkin's disease. Biopsy of a lymph gland showed a normal gland structure.

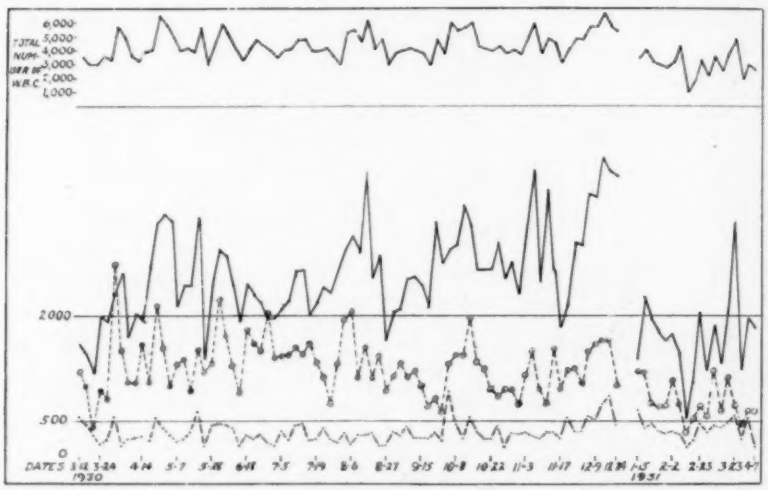

Fig. 3.—Actual number of the three types of leukocytes; the solid lines indicate the neutrophils; the circle and dash, the lymphocytes and the dot and dash, the monocytes.

On May 1, tripe was added to the diet and ventriculin was given to replace the liver extract. The general condition of the patient remained unchanged. She felt well and was able to do her work. On May 21, gastric analysis showed an absence of free hydrochloric acid and total acid 6 degrees. Dilute hydrochloric acid, 15 minims (0.92 cc.) three times a day, was added to the medication. The red blood count had increased temporarily with a corresponding temporary increase in the skin manifestation. Fluctuation in the blood condition may be noted on the chart. During early June reticulocytes increased to 3 per cent in a few examinations. Smear preparation showed improvement in shape, size, etc., of the red cells, and the white cells appeared more normal in morphology. Free hydrochloric acid was still absent in the gastric content. Late in June and during July, while the patient continued with a strict diet and medication, the white blood cells resumed the previous immature character and the red cells decreased in number.

The removal of sites of focal infection seemed important. In the presence of a general depletion of all blood elements, any operative procedure was considered

dangerous. Extraction of infected teeth was, however, undertaken. Two teeth were removed at a time at two week intervals. By these precautions six teeth were removed with no untoward effect on the clinical condition. We considered tonsillectomy too great a risk.

Early in August, 1930, gastric analysis revealed a reappearance of free hydrochloric acid of 6 degrees. At this time an autogenous vaccine was prepared from throat culture. Administration of the vaccine produced no effect. Examination of the stools was negative for blood and parasites.

Fig. 4.—Improvement in the lesions after medication.

On September 3, neoarsphenamine was administered intravenously in a dosage of 0.1 Gm., and was continued at five day intervals for three weeks. Quite a remarkable change was seen in the blood; the red cells increased in number and morphologically appeared more normal. The granular cells increased in number, and fewer premature forms were seen. The first change in the dermatologic condition came ten days after administration of neoarsphenamine, when the scaling decreased. There was a slight fall in cell elements on September 25, at which time the patient became quite ill and the skin lesions produced much scaling. Neoarsphenamine was discontinued and sodium thiosulphate was given intravenously. By October 10, the previous blood level was again recovered and the flare-up of the skin lesions subsided. Beginning October 13, tuberculin was given in therapeutic doses at fourteen day intervals for four weeks. The red and white

blood cells steadily decreased, and this therapeutic measure was discontinued. Neoarsphenamine was again administered, 0.1 Gm., at five day intervals. As was noted before, the number of red blood cells increased steadily to above 4,000,000, and the cells appeared more normal in smear preparation. The number of neutrophils increased, and myelocytes were present at the time to 1.6 per cent. The monocytes increased, and the blood platelet count increased to a normal level. On November 11, the color index decreased to 1 and remained at 1 or below 1. The skin lesions improved materially during the second period of neoarsphenamine therapy. The lesions on the face, neck and chest disappeared, except for the fine atrophy. The skin over the arms became much paler in color and only a slight erythema, the atrophy and the telangiectasia remained as a permanent picture.

While the improved blood condition was being maintained, the patient left the clinic on December 24, and returned on Jan. 15, 1931. During this interval the anemia diet was continued. Examination showed that the red cell count was still at the 4,000,000 level, but the number of white blood cells was greatly reduced and myelocytes were still present from 0.5 to 2 per cent. Neoarsphenamine in the previously mentioned dosage was again administered. There was a temporary fall in the number of red blood cells, which then returned to the former level. During March, 1931, the actual number of white cell elements reached an alarmingly low level, but on April 10, the white cell picture was essentially the same as at first observation and has remained so, with a decrease in neutrophils and lymphocytes and a normal number of monocytes. Myelocytes still persisted, and there was a slight shift to the left in granular cells. The red cells and platelets were quite normal, and the color index was below 1. It is quite remarkable that during the fluctuations noted in the hematologic record, the patient showed little or no change in her general condition and retained a good degree of physical reserve. We believe that our guard against debilitating medical or surgical intervention contributed to this maintenance of reserve in the presence of the general blood deficiency. The patient is still under observation at the clinic.

COMMENT

One must attempt to correlate the occurrence of the dermatologic condition with the blood changes. The features of particular interest in the blood were the qualitative and quantitative changes of both erythropoietic and leukopoietic elements during a long period of observation.

Although the dermatologic condition appeared first, we were impressed with the possibility that it may have represented an initial manifestation of a general disease. The low white cell count with a relative increase in monocytes seen on admission suggested a particular type of cell response to an infection or a toxic condition. The relatively sudden change in the differential count with the appearance of premature granular cells and the rapidly developing anemia and thrombopenia was difficult to explain. This was particularly true in that the dermatologic condition altered little.

The conditions that might produce hematologic changes similar to those described are: (1) pernicious anemia, (2) aplastic anemia, (3) aleukemic leukemia and (4) unusual response to infection.

1. *Pernicious Anemia.*—The features that suggested this condition were the glossitis, symptoms of severe anemia and absence of free hydrochloric acid in the gastric content. The blood findings in some respects were typical, namely, the severe anemia with a color index greater than 1, a tendency to macrocytosis, low white cell count, relative lymphocytosis and decrease in blood platelets. Certain observations in the blood examination were not typical. The degree of macrocytosis was not as great as usually seen in pernicious anemia. The presence of immature and premature cells, although it has been described, is unusual except in severe cases. The van den Bergh test never showed an increased hemolysis, the spleen was never palpable and there were no neurologic signs to indicate a nervous involvement. An adequate therapeutic test with a pernicious anemia diet failed to produce the usual reticulocyte increase seen in cases of pernicious anemia. Under careful dietary care, the anemia even became more severe. Relapses such as occurred in this case do occur in pernicious anemia, but with the absence of the cardinal features of pernicious anemia and the later reappearance of free hydrochloric acid in the gastric contents, such a diagnosis does not seem possible. Skin and mucous membrane manifestations with pernicious anemia are of a different nature than found in our patient. In pernicious anemia, pigmentary changes localized over the abdomen and back have been noted by Mayr,[1] Schucany[2] and Gans,[3] and on the oral mucous membranes by French.[4] In addition, the clinical changes on the mucous membrane of the mouth as described by Clough[5] are of importance. This description deals with that of a sore mouth, causing a great deal of discomfort, and a beefy red, dry, shiny atrophic and extremely tender tongue.

2. *Aplastic Anemia.*—Aplasia of bone marrow as a result of overexposure to the x-rays and poisoning by benzene, etc., may be ruled out by the lack of history of exposure to such agents. True aplastic anemia is characterized by a progressive decrease in all blood elements. It is frequently confused with terminal phases of pernicious anemia and unusually severe secondary anemia. In our case, the anemia, with decrease in blood platelets, absence of hemolysis and of enlargement of the spleen, was in agreement with this condition. Although the

1. Mayr, Julius K.: Die Erscheinungen an der haut bei innerer Krankheiten einschliesslich der durch Behandlung bedingten Schädigungen, Leipzig, F. C. W. Vogel, 1926, p. 18.

2. Schucany: Arch. f. Dermat. & Syph. **121**:746, 1916.

3. Gans, Oscar: Histologie der Hautkrankheiten, Berlin, Julius Springer, 1925, vol. 1, p. 125.

4. French, quoted by Mayr (footnote 1).

5. Clough, P. W.: Disease of the Blood, New York, Harper & Brothers, 1929, p. 125.

white cell count was reduced, the immature and premature granular cells in the blood stream were evidence of a lack of complete aplasia of white cell formation. Aplastic anemia makes no response to liver therapy, but also does not show remission as seen in our patient. The duration of the disease in this patient is longer than is usual in aplastic anemia. Symptomatic purpura hemorrhagica is the accompanying skin manifestation of aplastic anemia as noted by Clough,[6] Moore and Keidel,[7] Vedel, Giraud and Giraud.[8] In the instances cited in the last two references, aplastic anemia developed after administration of arsphenamine and novarsenobenzene, respectively, likely produced by the benzene radical of the drug.

3. *Aleukemic Leukemia.*—The usual onset of acute leukemia is associated with a leukocytosis of over 50,000 cells per cubic millimeter. Unusual cases have an onset with a normal or subnormal white blood count. Such an onset is more common in lymphatic than in myelogenous leukemia. This initial leukopenic or aleukemic phase has a variable duration and then is transformed by increase in white blood cells to a true leukemia. During the initial phase the clinical symptoms and signs of leukemia are usually manifest, and blood examination shows the presence of abnormal cell forms distinguishing the type of leukemia. Quite severe anemia, with a color index greater than 1, may develop in cases of aleukemic myelogenous leukemia. Recently Minot and Murphy [9] recorded a case of the type which was diagnosed as pernicious anemia. Later the white cell count increased, and a true leukemia developed. It appears important, therefore, to determine whether the reaction noted in our patient was true leukemia or a leukemia-like response. Anemia is a usual development in leukemia, although severe anemia is most common in rapidly progressive cases. The differential count in our patient, with many fairly mature granular cells, relatively few premature cells and a good number of other type cells would indicate a benign or chronic type of leukemic reaction. The anemia present appeared entirely too severe for such a benign reaction; the remission of anemia further would indicate it was not dependent on a leukemic change that continued to be manifest. The leukopenia has persisted much longer than is usual in aleukemic leukemia and has shown no tendency to develop into a true leukemic picture. Other clinical manifestations of leukemia have been lacking, as lymph node enlargement, splenic enlargement and hemorrhagic tendency. Positive diagnosis in

6. Clough (footnote 5, p. 102).

7. Moore, Earl J., and Keidel, Albert: Stomatitis and Aplastic Anemia Due to Neoarsphenamine, Arch. Dermat. & Syph. **4**:169 (Aug.) 1921.

8. Vedel; Giraud, and Giraud: Ann. de dermat. et syph. **4**:712 (Dec.) 1923.

9. Minot, G. R., and Murphy, W. P.: M. Clin. North America **10**:1093 (March) 1927.

the leukopenic phase of leukemia can be confirmed only by examination of the tissue and bone marrow. Biopsy of a lymph node in our patient showed no histologic evidence of leukemia. Leukemia is associated with dermatologic pictures, but of an entirely different appearance, which have been sufficiently clarified by reports of Hazen,[10] Ketron and Gay[11] and others to make clear that the syndrome presented by our patient does not fall into this category.

4. *Unusual Response to Infection.*—The usual hematologic response to infection is a leukocytosis with an increase in granular cells and an Arneth shift to the left. The granular cell changes may be so great as to simulate a leukemic reaction with myelocytes and myeloblasts present in the blood stream. This reaction has been termed leukemia-like or leukemoid. A demonstrable etiologic agent for the condition and the return of the blood picture to normal on recovery from the infection separates it definitely from true leukemia. Frequently great difficulty is experienced in classification if the leukocyte count is very high and when lymph gland or splenic enlargement is present. If the patient dies in such a state, histologic examination at autopsy is necessary for accurate classification. A leukemoid blood picture with leukopenia is infrequently seen and offers further difficulty in analyzation of leukemoid conditions. Krumbhaar,[12] in discussion of the leukemoid blood picture, reported a case with acute fever and ulcers of the gums with white blood count of from 3,300 to 5,600 and myelocytes up to 44 per cent. This patient recovered and regained a normal blood picture in eleven days. The leukemoid conditions of relatively short duration, as shown by this case, do not offer the differential difficulty presented by conditions of long duration as illustrated by our patient. In the leukopenic type of reaction there is depression of white cell formation. However, the centers of the bone marrow continue a degree of activity. It would appear that the inability to supply normal granular cells is overcome by the delivery of immature and premature cells into the blood stream. Such a bone marrow damage is unlike that seen in agranulocytosis where complete granular cell depression occurs and where all forms of granulocytes disappear from the circulating blood.

The initial dermatologic condition associated with foci of infection or toxemia may be regarded as an etiologic factor for the blood changes in our patient in that a primary blood condition or bone marrow dam-

10. Hazen, H. H.: Skin Changes in the Leukemias and Allied Conditions, J. Cutan. Dis. **29**:521 (Oct.) 1911.

11. Ketron, L. W., and Gay, L. N.: Myeloid Leukemia of the Skin, Arch. Dermat. & Syph. **7**:176 (Feb.) 1923.

12. Krumbhaar, E. B.: Am. J. M. Sc. **172**:519, 1926.

age by tumor, etc., could not be established. In the leukemoid reactions, anemia usually develops late in the disease and may be severe. In our patient the early severe anemia and thrombopenia appeared outstanding. Although the color index was greater than 1, the anemia was not hemolytic. As a result of treatment the dermatologic condition and the anemia improved greatly, and while the total white count has increased, premature granular cells still are present in the circulating blood in small number. If the blood condition is a secondary response, there still remains an infection of toxic substance producing bone marrow damage, particularly to the granulocytic elements. Further observation will be necessary to determine whether the white cells will return to normal later or whether a true leukemia may eventually develop. At present we believe that the greatest evidence is in favor of a leukemoid reaction.

From the foregoing differential discussion certain difficulties in diagnosis are evident. The diagnosis of pernicious anemia or aplastic anemia appears to be definitely excluded. The extreme duration of the blood condition with no tendency to develop into a usual leukemic state, and absence of clinical leukemic findings would seem sufficient to exclude aleukemic leukemia. Exclusion of a tuberculous or Hodgkin's etiology is accomplished by lack of clinical evidence of these conditions, and further by the characters of the dermatoses which do not correspond to the skin lesion of these conditions. With the exclusion of the foregoing conditions we believe that a leukemoid blood picture, secondary to an infection or toxemia, is the diagnosis of preference. Further observation is necessary to form a conclusive opinion. Should the patient die, autopsy will prove the existence of an unusual leukemia or a response to a possible septic focus. Should the patient completely recover hematologically, it would indicate a leukemoid reaction.

RÉSUMÉ OF THE LITERATURE ON SKIN AND MUCOUS MEMBRANE LESIONS AND THEIR RELATION TO THE BLOOD PICTURE

Sufficient has been said about the skin picture to put it definitely into the category of lupus erythematosus subacutus, and there is corroborating evidence in the literature that at least one phase of the blood picture, the leukopenia, is associated with this condition. Throne [13] in his clinical study, reports the case of a woman, aged 33, who showed an extensive involvement of the scalp, face, ears, neck, shoulders and arms, of three years' standing. This patient had a severe dental infection and a pyonephrosis. The blood picture showed leukopenia.

13. Throne, Binford: Lupus Erythematosus, Arch. Dermat. & Syph. **12**:33 (July) 1925.

O'Leary and Goeckerman [14] presented a woman, 35 years old, at the Minnesota Dermatological Society, with lupus erythematosus subacutus, whose leukocyte count was 4,700. He also presented another patient, a married woman, 21 years old, who had lupus erythematosus subacutus, and in spite of a febrile course the leukocyte count was only 5,800.

Stokes,[15] in discussing a patient presented at the Philadelphia Dermatological Society, stated:

> I would suggest adding the criteria for regarding a case as threatening dissemination, the low leukocyte count. The extreme leukopenia is characteristic. The count goes down as the patient's condition becomes worse. I have seen counts as low as 1,300 leukocytes with a high fever. Patients whose white cell counts are below 4,000 are to be regarded as potential candidates for dissemination if given a therapeutic shock.

Leukemia-like blood pictures have also been described with lupus erythematosus. Schmidt [16] reported such an instance. His patient recovered after intravenous injections of gold preparations. Although the hematologic evidence in the patient is somewhat doubtful, one can state with accuracy that myelocytes were present with the neutrophilic count shifting to the left. However, the fact of recovery and the high polymorphonuclear count seems to be against the diagnosis of leukemia.

The entire picture, that presented by the skin, the mucous membrane and the blood, can be summarized under the diagnosis of lupus erythematosus subacutus as a manifestation of the apparent lack of resistance of the patient to some constantly recurring and harbored infection or toxin which, under duress other than ordinary, will light up and may terminate the life of our patient.

SUMMARY

A survey of this report seems to justify the following summary:

1. The clinical syndrome known as lupus erythematosus subacutus or acutus is associated with a peculiar blood condition resembling a leukemoid or a leukemoid-like reaction with anemia and thrombopenia.

2. Frequent and meticulous examination of the blood are necessary if this blood reaction is to be found.

3. The reaction of the hematopoietic system is an integral part of the clinical syndrome and may be due to either an infection or toxemia

14. O'Leary, Paul; and Goeckerman, W. H.: Subacute Lupus Erythematosus Disseminatus, Arch. Dermat. & Syph. **15**:91 (Jan.) 1927.

15. Stokes, John H., in discussion on Strauss: Lupus Erythematous, Arch. Dermat. & Syph. **17**:744 (May) 1928.

16. Schmidt, Frederick R.: Lupus Erythematosus with Leukemic Observations, Arch. Dermat. & Syph. **20**:217 (Aug.) 1929.

of focal origin or to a lack of resistance, either one of such overwhelming degree as to put a tremendous and constant drain on the blood forming organs.

4. We are further convinced that the lack of interference with the diseased tonsils has been of benefit to this patient and would emphasize the warning given in our introductory statement in regard to what Stokes calls "therapeutic shock."

5. Neoarsphenamine in small doses acted beneficially on the skin and blood condition.

SYPHILIS AS A SHAMEFUL DISEASE*

DOUGLASS W. MONTGOMERY, M.D.
SAN FRANCISCO

THE REPRESSION OF SYPHILIS IN ANGLO-SAXON COUNTRIES

Every disease has its own social status, and is well or ill regarded accordingly. Syphilis is a good example of a great disease, momentously fateful to the human being, but which has often suffered from neglect because of its ill repute socially. I can remember when the general practitioner, and even the teachers in medical schools, regarded those who taught its wonderful history and its intricate symptomatology, and who practiced and taught its elaborate and effective treatment, as being on a lower social level than the rest of the profession. Gradually, through the energetic work of such men as Fournier and Erb, the importance of syphilis as an etiologic factor among the most highly respected diseases, such as locomotor ataxia for example, began to be recognized. Still syphilis, as such, continued to be a despised disease in the Anglo-Saxon world, and its position in institutions of learning was among those things tolerated but not cherished, and syphilographers were not accorded the same respect in this country that they received, for instance, on the European Continent.

The subject of syphilis was never mentioned in public, and even physicians who were particularly interested in it participated in this attitude of silence and repression. Even as late as 1908 I remember how startled a well known syphilographer was on seeing the word, syphilis, in one of the great New York daily papers. This involuntary dislike of hearing the word in public may be partly due to its sibilant, almost hissing, sound. That Fracastor should have chosen the name, Syphilus, for the shepherd in his poem on the disease, and that the world should have taken syphilis as the name of the disease to the almost entire exclusion of about 500 other epithets, is one of the historical curiosities.

This almost involuntary and universal repression was carried out, as far as the public was concerned, in spite of the fact that syphilis, as a public question, is only inferior in interest to the great general infective diseases such as typhoid fever, diphtheria and the plague. Now that these diseases are under control, syphilis may be considered as ranking equally with them in importance. With a wider knowledge of the disease and with more general application of good methods of treatment

* Submitted for publication, May 15, 1931.

and prophylaxis, there is now a reasonable hope that it may be so controlled that it also may follow the path of smallpox and scabies, and instead of being a general affliction it may become an occasional accident.

THE CHANGE IN SENTIMENT TOWARD SYPHILIS

Among physicians a great change was wrought in the status of syphilis when in 1907 the Wassermann reaction was developed, and it began to be realized what a widespread etiologic influence the disease had. A further great change took place on the introduction of arsphenamine. Lesser, but still changes of vast importance followed the discovery of Spirochaeta pallida in dementia paralytica (Noguchi), and in the heart in cardiac degeneration (Warthin). These great discoveries have led to syphilis occupying a major place in the chair of medicine in universities.

As time goes on it will be seen how much this will tend to real scientific medical progress. Up to the present there is no doubt that, in the department of internal medicine as in so many others, it has acted as a stimulus to investigation, leading, as Hoffmann has recently pointed out, to the discovery of the causes of frambesia, Weil's disease and rat-bite fever. Up to the work of Metchnikoff, Schaudinn, Ehrlich and others, progress in syphilis had been almost confined to the conscientious and able work of specialists in this disease.

Among the general public the greatest change in sentiment has been produced by the Wassermann reaction, as it agrees exactly with the popular belief of syphilis as a "blood disease." It is now not at all uncommon for respectable women to ask for an examination of the blood, the same class, in fact, that formerly would have felt deeply injured at any hint of such a contamination. This examination and the diffusion of the knowledge throughout the public that syphilis is not at all necessarily linked with moral obliquities, but may be contracted by perfectly innocent people, have done a great deal to lift it out of the category of things shameful. Whether this change is due to fuller knowledge of syphilis or whether it is only a part of a broader movement, it is difficult to estimate. Especially among young people there seems to be more and more an inclination to discuss syphilis as an ordinary disease on the same footing with, for example, cancer or tuberculosis. This, however, may be only one phase of a general tendency that has been operative for some years. The Beards, quoting Lodge, say that formerly it was not good manners to discuss physical ailments in general society, but that now surgical operations, physical functions and diseases and their remedies are freely and fully discussed at dinner and on all other occasions by the ingenuous youth of both sexes.[1]

1. Beard, Charles A., and Beard, Mary R.: The Rise of American Civilization: The Industrial Era, New York, The Macmillan Company, 1927, vol. 2, p. 389.

Where this new development will lead is hard to foretell. One good result of this change in sentiment is the more general recognition of syphilis as an existing evil in any sane estimation of social medicine. In estimating the importance of these changes, however, one must reflect that revolutions in sentiment constitute the great revolutions of the world.

SYPHILIS AT FIRST NOT REGARDED AS A SHAMEFUL DISEASE

In studying the revolution in sentiment which we are now passing through it is interesting to compare our present attitude toward this disease with the estimation in which it was held during the first few years of the great epidemic beginning in 1493. It was then not regarded as a shameful disease, or even primarily as a venereal disease, as it was supposed to have come in the first place from an evil conjunction of the stars.

It is true also that the orthodox physicians of those days did not wish to treat persons with syphilis, and for two reasons. In the first place, they did not like its unseemly, often malodorous, manifestations. With the employment of arsphenamine and mercury internally and the use of antiseptics externally, these disagreeable attributes are now entirely eliminated. We must also remember that even the use of mercury in those days was accompanied by the horrible stench of salivation, and that the condition of the syphilitic patient was one long tale of misery.

Another reason the orthodox physicians had for not wishing to treat persons with syphilis was scholastic. It was a most exasperating disease, as it was impossible to make it comply with the then prevalent Galenical theories of medicine. This attitude of almost religious bigotry it is difficult to appreciate now. These theories and traditions were accepted as facts, and formed the substance of a great and powerful professional religion. Both Galen and Saint Paul were missionaries preaching beliefs, the one medical, the other moral.[2] That syphilis did not square with these beliefs aroused both the contempt and the animosity of the orthodox believers. The old medical religion got many a hard knock, as for instance by Harvey, who nevertheless continued to believe in it even after his demonstration of the circulation of the blood. The stiffest blow the old humoral theories received, however, according to W. H. Welch, came from the success of the employment of cinchona bark in the treatment for the malarial fevers. Mercury cleared up the symptoms of syphilis; there was no denying that, but its success could be attributed to its causing salivation, and therefore clearing the humors of their peccant material, and they certainly worked the theory till the

2. Brock, Arthur J.: Greek Medicine, New York, E. P. Dutton & Company, 1929, p. 31.

teeth of their poor patients jingled in their heads. But quinine was different; it undoubtedly cured "the chills," but it did not stimulate any emunctory, and therefore could not be said to free the body from any morbid humor. In its case the humoral pathology clearly did not fit.

SYPHILIS AND MARITAL CONTINENCY

In the beginning of the sixteenth century marital continency was not expected, and it was usual for people in all walks of life, even the most respectable, to visit houses of prostitution as an innocent amusement. Under such circumstances the spread of syphilis was very rapid. Erasmus (1466-1536), living and active in the thick of the great epidemic, said that in his day a man who did not have it was accounted a rustic and not a polished gentleman.[3]

A good example of how syphilis was then regarded is furnished by Ulrich von Hutten (1488-1523), one of Germany's great poets and thinkers. He wrote a most instructive treatise on his own case, describing minutely his symptoms, and he mentioned his father as being also afflicted with the same disease. Furthermore, he dedicated this work to the Most Reverend Father, the Prince Bishop of Mayence and Magdeburg.[4]

In the same manner Joseph Gruenbeck (1470-1531), secretary of the Emperor Maximilian, a writer of note and a priest, wrote up his own case in a most interesting way, from the acquisition of his infection in 1501 until his recovery. He gave his experience the same wide publicity as Ulrich von Hutten did, and with an equal freedom from any feeling of shame. He dedicated his work to John Reuchlin, otherwise called Capnion, one of the most celebrated men of his time, for both eloquence and erudition.[5]

Benvenuto Cellini (1500-1571), although he lived later than these two, may also be mentioned, as he wrote up his personal experiences with this disease, and the manner in which he finally cured himself, and with an equal freedom from either bravado or penitence as indicating any sense of moral degradation whatever.[6]

This charming frankness in personal medical matters may also have had another source.

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3. Bloch, Iwan: Der Ursprung der Syphilis, Jena, Gustav Fischer, 1901.

4. von Hutten, Ulrich: Ueber die Heilkraft des Guaiacum und die Franzosenseuche (De guaiaci medicina et morbo gallico), translated by Dr. med. Heinrich Oppenheimer, Berlin, A. Hirschwald, 1902.

5. Gruenbeck, Joseph: De mentulagre ou mal francaise, translated by A. Corlieu, Paris, 1884, p. 23. Gruenbeck recognized syphilis as being a venereal disease, as he called it "mentulagre." "Mentula" is the male sexual organ.

6. Cellini, Benvenuto: Vita.

When syphilis appeared in Europe it was customary for the professors in the medical schools and for writers on medicine to mention incidents in the treatment of celebrated men who had been under their care. This custom seems to have come down from ancient times, for Galen habitually took his class of students with him in making his professional visits to his most aristocratic patients. Walter Pater mentions Galen, accompanied by his class of students, making a professional call on the Emperor Marcus Aurelius, and undoubtedly that philosopher monarch was highly edified by the pure Greek spoken at his bedside by the learned and controversial clinician.[7] When syphilis appeared this freedom in publication was extended to its sufferers also, and often with an added tang of acrimony as the controversy in regard to the employment of mercury soon took on a polemical form. Von Hutten, Gruenbeck and Cellini are all good examples of this, and this would serve to draw the attention of the public to the disease. Any controversy on treatment always does.

Not long, however, after the appearance of syphilis in Europe a well known physician, in writing a treatise on syphilis in which he had had a wide experience, not alone mentioned the names of his eminent patients, mostly high church dignitaries, but also gave their official position. He seems, however, to have hit on a time or place in which secrecy in sexual relations was more prized, and the edition of his book was suppressed. This may have been the origin of the inviolability of professional medical secrecy, a great step forward in professional dignity.

The suppression of this book would indicate a change in the moral attitude toward this disease. It is not to be supposed that there was the least contrition on the part of those implicated, as they were all politicians of an exceedingly bad type. It did, however, show sensitiveness to public opinion, a power which has increased from century to century down to the present, and which no politician can now afford to neglect. It is also interesting that this, one of the first instances of the power of public opinion, should relate to syphilis.

In Fernel's time (Fernel died in 1558) syphilis began to be considered an improper malady.[8]

The views of theologians regarding syphilis were at first very lenient, as indicated, but as the terrible nature of the disease became more evident it began to be regarded as an expiatory disease, and a punishment for sin. This view was quite prevalent down to recent times. I can remember a well meaning man objecting to having the

7. Pater, Walter H.: Marius, the Epicurean.

8. Proksch, J. K.: Die Geschichte der venerischen Krankheiten, Bonn, P. Hanstein, 1895-1900, vol. 2, p. 343.

United States troops treated, with the idea that they should suffer for their iniquities.

I also remember that in 1883 Isador Neumann, then professor of venereal diseases in Vienna, felt impelled to impress on us the fact that syphilis was not a punishment for sin but simply a highly contagious disease, and this, of course, is the more enlightened view. For instance, some statistics show that 10 per cent of syphilitic men and 20 per cent of syphilitic women get their trouble innocently. And this does not include those who are hereditarily contaminated, so that there is a vast army of people who by no stretch of theological reasoning can be accused of lewdness or sin in the acquisition of their affliction.

THE GOOD ACCRUING FROM SYPHILIS

Syphilis has been scorned, neglected, repressed, denounced and anathematized, but finally now a widespread serious effort is being made to understand it, and to minimize and to eliminate its evil effects. Like all powerful agents in natural history it, in its course, has accomplished much good as well as much evil. As mentioned, syphilis has had much to do with the development of that just and highly prized privilege of professional secrecy. Syphilis from the very beginning has acted as a powerful moral ferment. It immediately began to change the views on sexual hygiene, and incidentally brought about a social revolution in regard to connubial constancy. When a man ran the danger of introducing into his family such a manifold evil as syphilis, caution prevented him from erring. Our modern idea of the sacredness of the marriage bond was unknown in the ancient world or in the Middle Ages, and this admirable institution, so full of blessings to society, is undoubtedly in a great measure the result of the introduction of this fearful virus.

To scabies, impetigo and, principally, syphilis, is due the hygienic condition of hotels. This cleanliness was also something unknown in primitive society or in the ancient world. With the development of commerce, and the concomitant spread of syphilis, there was an urgent demand that transient dwelling places should be clean. Wealth, of course, had much to do with this, but syphilis and the other contact diseases were powerful accessories.

Up to the time when syphilis appeared in Europe physicians were perfectly content with the Galenical system of medicine, which indeed adapts itself wonderfully to popular explanation. But syphilis was not primarily due to any internal disturbance or change in the humors of the body; it was manifestly acquired from the outside, and shortly after inoculation gave rise to the gravest disorders, both on the skin and in the internal organs, which defied systematization according to the Galenical system. The final overthrow of the Galenical system was due to Harvey's discovery of the circulation of the blood, and to the discovery

of the thoracic duct by Pecquet, and as before mentioned, to the introduction of cinchona, but syphilis was always a disturbing factor, unsatisfied with any but a true solution of its nature, and although not among the primary reasons for the overthrow of the old system, yet it never could be brought into accord with it.

Syphilis is an excellent example of the fact that there is no morality in nature, that our conception of what is good and what is evil is entirely related to the way things affect us. Those things that cause us inconvenience or danger are evil; those things that are favorable to us are good. But as John Burroughs has said: "In the councils of the Eternal there is apparently no such distinction."[9] It may even be that in the ultimate scheme of things Spirochaeta pallida may be of more importance than ourselves, which, however, is no argument against fighting it at every turn, and alleviating in every way possible the misery occasioned by it.

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9. Burroughs, John: The Faith of a Naturalist, North American Review, November, 1919.

Obituary

GUSTAVE ARCHAMBAULT, M.D.

1883-1931

In the midst of a life of great activity and usefulness, death chose to close prematurely the career of Dr. Gustave Archambault of Montreal, and in so doing, removed from our midst a gentleman and a dermatologist of note.

Dr. Archambault filled many positions of honor and trust. He held the chair in dermatology at the University of Montreal, and was the head of the large and important dermatologic service at Notre Dame, which hospital had recently built an entire new wing for his department.

At various times, he served as secretary-general of the Association of French-Speaking Physicians of North America; president of the Canadian Branch of the British Association of Dermatology and Syphilology, and of the Medical Society of Montreal and secretary and treasurer of the Medical Union of Canada. He was a member of the French Society of Dermatology and Syphilis, and several articles of his have appeared in its bulletin. He served with great distinction in the World War, and received several decorations, among which may be mentioned the Legion of Honor.

Dr. Archambault was tireless in his efforts to knit closer together the French-speaking physicians of North America. He had a great many friends in the United States, whose visits to Montreal will never seem the same now that this pleasing, agreeable and kindly personality has passed away forever.

PAUL E. BECHET, M.D.

Abstracts from Current Literature

EDITED BY DR. HERBERT RATTNER

FURTHER STUDIES IN A CASE OF CALCIFICATION OF SUBCUTANEOUS TISSUE ("CALCINOSIS UNIVERSALIS") IN A CHILD. WALTER BAUER, ALEXANDER MARBLE and G. A. BENNETT, Am. J. M. Sc. **182**:237 (Aug.) 1931.

The article on this rare condition comprises a complete report of the chemical and histologic examination of nodules and of a study of the nitrogen, calcium and phosphorus metabolism.

Photographs and roentgen studies that show the cutaneous and subcutaneous involvement are also included. The nodules were variable in size up to 1 cm. in diameter and were widely distributed, being most numerous on the extremities, particularly about the knees, elbows and the anterior aspect of the legs. No nodules were present on the scalp, thorax or abdomen.

Metabolic studies revealed an abnormal retention of both calcium and phosphorus in spite of normal blood values for these substances.

Chemical analysis of an excised nodule revealed a small quantity of uric acid, a moderate amount of cholesterol and fatty acids, calcium and phosphorus, the last two as found in adult bone and pathologic calcification.

Their results would suggest a faulty calcium-phosphorus metabolism as the basis of this condition.

PSEUDONEOPLASTIC SYPHILITIC GRANULOMATA. HENRY MILCH and WALTER GALLAND, Am. J. M. Sc. **182**:405 (Sept.) 1931.

Case reports are presented in which tumor masses were found in or about muscles. Two types were found—one in which there was a discrete, apparently benign tumor formation, and a second in which there was a more diffuse invasion of the muscle. Differential diagnosis between these masses and a true malignant condition was very difficult, pathologic examination being necessary in some instances to determine the true nature of the lesions.

Emphasis is laid on the necessity for careful laboratory tests and also for making the therapeutic test before resorting to operation.

JAMIESON, Detroit.

A STUDY OF THE BLOOD PICTURE IN CONGENITAL SYPHILIS AND THE EFFECT OF ANTI-SYPHILITIC THERAPY UPON THE HEMOGLOBIN AND CELLULAR ELEMENTS. H. H. PERLMAN and C. S. WRIGHT, Am. J. Syph. **15**:449 (Oct.) 1931.

A rather extensive review of the literature is presented. The authors investigated the presence of anemia in congenital syphilitic infants and children prior to antisyphilitic therapy, whether or not the incidence of secondary anemia in congenital syphilitic children is greater than that in nonsyphilitic groups of children and the effect of antisyphilitic remedies on the blood picture. They conclude that: Secondary anemia present in congenital syphilis is like all anemias associated with chronic infectious disease; the degree of anemia may be no greater and no different from that found in supposedly healthy children; no reliance can be placed on the degree of anemia as a diagnostic sign, and, finally, the study of the individual cells reveals nothing of diagnostic or prognostic importance. No cases of true syphilitic anemia were encountered by the authors in their study of thirty-four cases. They found that antisyphilitic therapy had a variable and inconsistent effect both on the secondary anemia when it was present and on the differential blood count.

SEROLOGIC RESULTS IN MALARIALLY-TREATED GENERAL PARESIS. J. E. NICOLE and E. J. FITZGERALD, Am. J. Syph. **15**:496 (Oct.) 1931.

Because of the scarcity of detailed reports concerning serologic results in the cerebrospinal fluid following malarial therapy for dementia paralytica, the authors compiled their findings. Some of their reexaminations were done as long as six or seven years after the malaria.

The authors conclude: The cerebrospinal fluid improves slowly after malaria therapy, the improvement being most marked when four or more years have elapsed since treatment; the cell count and Boltz reaction improve earlier than the colloidal gold reactions; the spinal fluid may, at times, become completely normal, although the serologic improvements bear no relation to the clinical advance.

As specific tests, the authors favor the Wassermann test over the Sachs-Georgi and Meinicke reactions. It is interesting to note that in their unselected series of fifty-eight cases, 22.5 per cent gave a history of head injuries.

THE TREATMENT OF EARLY NEUROSYPHILIS. A. B. CANNON, Am. J. Syph. **15**:517 (Oct.) 1931.

Based on the assumption that late neurosyphilis is a preventable disease and that dementia paralytica is on the increase in New York State, the author presents a plea for more adequate treatment in cases of early syphilis in which, it has been estimated, neurosyphilis develops in from about 25 to 33.33 per cent. The author divides early neurosyphilis into two groups, asymptomatic and symptomatic. Late neurosyphilis, he summarily states, is the result of: no treatment, interrupted treatment, inadequate treatment, infrequent treatment or the use of inferior drugs.

The author, one of the few in this country still doing intraspinal therapy, uses intraspinal medication in early asymptomatic neurosyphilis when the fluid does not respond to ordinary therapy and when from the start the fluid shows a particularly grave prognosis, such as, a strongly positive Wassermann reaction, a high cell count and a paretic curve, that is, a very active infection. He also employs it immediately in early symptomatic neurosyphilis in cases in which considerable meningeal involvement is usually in evidence.

A brief résumé of the technic of intraspinal therapy as used by the author is presented, and a plea is made for more frequent examinations of the cerebrospinal fluid and for the use of intraspinal therapy in the cases of early neurosyphilis that do not respond to the ordinary therapy. It would seem from this article that the cause of the disrepute into which intraspinal therapy has fallen has not been because of the method, but because of an improper selection of cases, for the only indication for intraspinal therapy lies in the treatment for early neurosyphilis.

CISTERN PUNCTURE. L. JACOBI, Am. J. Syph. **15**:544 (Oct.) 1931.

This is an excellent article dealing with the history, development, technic, use and value of cistern puncture. The author brings out that, to the syphilologist, the chief advantages of this method of obtaining cerebrospinal fluid are the insignificant after-effects and the needlessness of rest in bed. The technical difficulties, he implies, are comparable to those in spinal puncture, but cistern puncture presents more serious risk because of the chances for trauma to the medulla and for hemorrhage from injury of an artery. In well trained hands it should be a useful method.

REUTER, Milwaukee.

CUTANEOUS LESIONS ASSOCIATED WITH A DEFICIENCY OF VITAMIN A IN MAN. C. N. FRAZIER and CH'UAN-K'UEI HU, Arch. Int. Med. **48**:507 (Sept.) 1931.

The skin lesions described in this article occurred in patients who had keratomalacia of from two weeks' to three months' duration. The patients, fifteen soldiers, had subsisted for periods of from six months to a year or more on a diet of rice, maize, millet, wheat flour, white cabbage and salted vegetables.

The development of the lesions followed a fairly definite course—dryness and roughness of the skin followed by the appearance of spinous papules involving the hair follicles on the thighs and forearms and spreading to the extensor surfaces of the extremities, shoulders, lower part of the abdomen, chest, back and buttocks. The articular folds were dry and covered with closely adherent scales. The papules enlarged as the disease progressed, each papule having in its apex a keratotic plug which, on removal, left a central gaping crater. Marked tendency to pustulation was noted on the extremities.

When the patient ate a well balanced diet, the lesion improved steadily. Histologic examination showed the condition to be essentially one of hyperplasia and hyperkeratinization of the epithelium of the epidermis and hair follicles.

Although a specified diet is rarely deficient in one vitamin alone, the writers feel justified in assuming that the cutaneous changes noted in connection with ocular changes were part of the specific syndrome produced by deficiency of vitamin A.

JAMIESON, Detroit.

ELIMINATION DIETS FOR THE DIAGNOSIS AND TREATMENT OF FOOD ALLERGY. I. WATERS, J. Allergy **2**:225 (May) 1931.

This is a very useful list of diets employed at the Vanderbilt Clinic for the diagnosis of food allergy and in the treatment for it. It contains eight elimination diets for adults and children and a list of suggested menus for each of these. There are also included diets for those who eat in restaurants. Of great practical value are the notes on the composition of many popular foods. These diets were found to be practical, and it was easy to persuade patients to adhere to them rigidly.

ELIMINATION DIETS AS AN AID IN THE DIAGNOSIS AND TREATMENT OF ECZEMA. J. G. HOPKINS, I. WATERS and B. KESTEN, J. Allergy **2**:239 (May) 1931.

A group of 112 patients with chronic eczema was studied. The elimination diets described in the preceding abstract were used. In 63 patients under 7 years of age, food was shown to be the sole cause of the eruption in 15 (24 per cent) and a contributing cause in 28 (44 per cent). In 49 patients over 7 years of age, food was shown to be the sole exciting factor in 4 (8 per cent) and a contributing cause in 18 (37 per cent). The foods most often implicated were egg, milk, wheat, orange, cod and tomato.

This study shows the value of elimination diets in the diagnosis of chronic eczema. They are superior to skin tests in that they give direct evidence of the relationship of sensitivity to the patient's symptoms, enable one to detect sensitivity during periods when the skin reaction is suppressed, and are always available for use. The disadvantages of these diets are the difficulty in interpreting results, the tediousness of the procedure and the difficulty of keeping the diet free from the most common allergens. For accurate diagnosis, it is best to use the elimination diets in combination with the skin tests.

CARO, Chicago.

IS THE RAT DERMATITIS CONSEQUENT ON VITAMIN B_2 (G) DEFICIENCY TRUE PELLAGRA? S. S. GURIN and W. H. EDDY, J. Exper. Med. **54**:421 (Sept.) 1931.

The result of the experiments reported here leads the authors to question whether the B_2-free diet which resulted in dermatitis in rats depends for its action on a factor identical with that which is preventive of pellagra in human beings.

Dermatitis developed in rats on a diet free from vitamin B_2 (G); the histologic picture of the skin, however, differed from that of human pellagra.

It is possible that this dermatitis may be of diverse types, but more experimental work will be necessary before this can be definitely determined.

JAMIESON, Detroit.

HERPES ZOSTER AND VARICELLA. EUGENE F. TRAUB and JESSE A. TOLMACH, New York State J. Med. **31**:1072 (Sept. 1) 1931.

Two cases are reported in which herpes zoster was associated with varicella. The mass of reports and the experimental work to date do not prove any relationship between the diseases. Some of the cases may be simply pure coincidences, just as any other two or more diseases may occur in one patient at the same time. Another point is that it is possible that the same agent that causes varicella may in some cases produce local manifestations similar to zoster. It has been stated that true herpes zoster has no connection with any other disease. The zoster may be due to some micro-organism that causes varicella; in other words, they may be different clinical expressions of the same agency; but zoster-like eruptions are not true zoster. Further investigations may prove a relationship between the two diseases, but at the present time there is not sufficient evidence to prove that the association of true herpes zoster and varicella is other than a chance coincidence.

REPORT OF A STUBBORN CASE OF ACTINOMYCOSIS CLEARED UP BY ELECTRO-COAGULATION. LEWIS J. SILVERS, New York State J. Med. **31**:1162 (Sept. 15) 1931.

A brief case report is given in which the actinomycotic process was gradually, but entirely eradicated from the mouth by electric coagulation. The case was a proved one, and the treatment administered was comparatively mild, yet a cure was accomplished in about six weeks.

EUGENE F. TRAUB, New York.

CUTANEOUS CALCIFICATION WITH SPECIAL REFERENCE TO SO-CALLED "CALCIFIED EPITHELIOMA" (NEVUS OSSIFICANS). F. FLARER, Urol. & Cutan. Rev. **35**:284 (May) 1931.

The author reviews the literature on cases of cutaneous calcification and adds the description of two of his own cases. In one, the tumor occurred on the arm of a woman, aged 47, and had the histologic appearance of an epithelioma that had become calcified. In the second case, the tumor was present on the arm of a woman, aged 32, and was apparently a calcified cyst originating in a sweat gland.

A CASE OF AMEBIASIS CUTIS AFTER INCISION OF A PERICECAL ABSCESS. E. L. MARWITS and P. B. VAN STEENIS, Urol. & Cutan. Rev. **35**:313 (May) 1931.

This is a report of a case of amebiasis cutis secondary to incision and drainage of a pericecal abscess. A cure was obtained by subcutaneous injections of emetine hydrochloride followed by the oral administration of stovarsol.

CARO, Chicago.

THE DEMONSTRATION OF VIABLE LEISHMANIA IN THE FAECES OF EXPERIMENTALLY INFECTED BED-BUGS. D. B. BLACKLOCK and E. M. LOURIE, Ann. Trop. Med. **25**:359 (Aug.) 1931.

In these experiments four strains of Leishmania were employed. Bed-bugs artificially inoculated with these organisms were found to pass viable forms up to thirty-five days after infection.

JAMIESON, Detroit.

INTRA-EPIDERMAL CARCINOMA OF THE SKIN. LOUIS SAVATARD, Brit. J. Dermat. **43**:161 (April) 1931.

Savatard presents a brief description of eleven cases, six from his own practice and the others from that of some of his colleagues. Five were in men and six in women, the ages ranging from 36 to 83 years. In six cases the lesions were

solitary, and in five there were multiple lesions. In three of the cases the lesion was associated with other types of carcinoma elsewhere in the skin. The clinical and histologic picture of the lesions is discussed in detail, with numerous illustrations of the clinical and microscopic picture. In considering carcinoma of the skin one is struck by the multiformity of the clinical and histologic pictures presented. While all epidermal cells originate from the basal layer, it is only in the pure basal carcinoma that there is proliferation of basal cells alone. In the squamous carcinoma differentiation continues. The author believes that one reason for mistakes in clinical differential diagnosis is the lack of appreciation of how slowly growing some squamous carcinomas of the skin are. The earliest clinical manifestation of a squamous carcinoma is a thickening of the skin suggesting a follicular keratosis; i. e., there is central keratosis with slight tumor formation around.

He states that his thesis may be summarized in three paragraphs:

(1) Epidermic carcinomas of the skin, whether of the basal, squamous or mixed type, are *initially* confined to the epidermis, and are, therefore, intra-epidermal carcinomas.

(2) Intra-epidermal carcinomas may (*a*) remain within the epidermis indefinitely —when they present the clinical pictures of the so-called benign erythematoid carcinoma of Little; or (*b*) they may atrophy; or (*c*) they may break through the basal layer, infiltrating the corium and deeper tissues, when they present the clinical picture of the usual rodent ulcer or epithelioma.

(3) Bowen's disease, the so-called senile keratosis of the face, senile keratomata of the backs of the hands, keratosis on lupus scars, etc., are clinical manifestations of carcinoma and are not, therefore, *pre*-carcinomata.

M. S. WIEN, Chicago.

A RINGWORM EPIZOOTIC IN MICE. H. J. PARISH and S. CRADDOCK, Brit. J. Exper. Path. **12**:209 (Aug.) 1931.

The authors describe an epizootic in which nearly 50 per cent of a breeding stock of 2,500 mice were infected with Trichophyton gypseum-asteroides. In the course of events, four laboratory attendants were also infected. The authors cite experiments to show that epizootics in mice are apparently rare, although tineal infections are endemic in these animals. They believe that some predisposing factor or factors determined the virulence of the reported outbreak. The source of the infection could not be clearly traced.

IMMUNIZATION WITH KILLED HERPES VIRUS. S. T. BEDSON, Brit. J. Exper. Path. **12**:254 (Aug.) 1931.

Until comparatively recently it was generally accepted that filtrable viruses, with a few exceptions, gave rise to little or no immune response, unless they were employed in the living state. The author's experiments were with a skin strain of herpes virus inoculated into the skin of guinea-pigs. He was able to show that herpes virus treated with low concentrations of formaldehyde is capable of producing a high degree of immunity in guinea-pigs, and that this immunity is produced by dead virus. He furthermore was able to prove that herpes virus killed by heating at 60 or 100 C. is devoid of immunizing power; but if the virus is treated with formaldehyde before heating it at 100 C., it is still capable of producing some immunity.

CORNBLEET, Chicago.

VACCINE TREATMENT OF LEPROSY. M. A. GOHAR, J. Trop. Med. **34**:166 (June) 1931.

Previous attempts to treat leprosy by means of vaccines are reviewed, and the author's method of preparing his vaccine is given in detail.

As a result of this vaccine treatment a number of patients with nodular leprosy showed a remarkable improvement, but anesthetic cases were very resistant.

It is suggested that this method of treatment might be advisable as a prophylactic measure for attendance at leprosaria.

PARASITIC FUNGI OF THE SKIN. ADELIA MCCREA, J. Trop. Med. **34**:204 (July) 1931.

The results of the author's experimental work are here given with reference to fungus diseases of the skin: (1) isolation of causative organisms, (2) attempt to develop an antigenic agent, (3) inoculation of guinea-pigs to test comparative treatments, and (4) an attempt to determine the persistence of the organism in the tissues.

Trichophyton interdigitale Priestley was found to be the most common invader, the Epidermophyton being found one-third as often as the Trichophyton.

It was not found possible to produce immunity in the skin of guinea-pigs with these organisms, as three successive infections in the same areas had been produced repeatedly.

JAMIESON, Detroit.

URTICARIA: SOME OBSERVATIONS UPON THE VASCULAR REACTIONS IN THE SKIN. KENNETH E. HARRIS, Quart. J. Med. **24**:347 (April) 1931.

The author examined the reactions of the skin in subjects suffering from spontaneous urticaria. The mechanism involved in the production of urticaria is the same as the "triple response" described by Lewis in the reaction of the skin to injury. This triple response consists of (*a*) a local dilatation of the arterioles, capillaries and venules by direct action on the vessels; (*b*) a locally increased permeability of the walls of the minute blood vessels by direct action, leading to local edema of the skin, usually called "whealing," and (*c*) a widespread dilatation of the surrounding arterioles, known as the flare" and resulting from a local axon reflex. The cause of this response is thought to be due to "H-substance," a histamine-like substance liberated from the skin cells. The author presents interesting diagrams showing the spread of the urticarial wheal. Transference tests yielded results that suggested that in cases of spontaneous urticaria a toxic body circulates in the blood capable of producing the spontaneous whealing.

BRADFORD, Rochester, N. Y. [AM. J. DIS. CHILD.].

RÔLE OF THE ENTEROCOCCUS IN INFANTILE ECZEMA. H. MONTLAUR and MME. MONTLAUR, Nourrisson **19**:161 (May) 1931.

Cultures made from the skin lesions produced gram-positive cocci which were identified as enterococci. The same organism was also recovered from the normal skin of healthy infants. Bacteriologic studies of the stools from infants with eczema showed both enterococci and Bacillus coli, the former predominating. Chemical studies of the stools of breast-fed infants showed an increase in the organic acids. The stools of those fed artificially showed no such increase. Intradermal injections of vaccines prepared from streptococci were tried in thirty-two infants with eczema. Negative reactions were present in thirty. The results of intradermal injections of enterococcal vaccine were sometimes positive but usually negative. After the intradermal injections of enterococci the eczematous lesions were temporarily aggravated, and then showed marked improvement. This observation led to the use of the vaccine in a series of infants with eczema, with excellent results. The skin lesions improved or disappeared, and the digestive disturbances were also benefited.

THE PAGET CELL. C. KREIBICH, Arch. f. Dermat. u. Syph. **163**:467 (July 23) 1931.

Kreibich considers the characteristic cell found in Paget's disease of the breast an anaplastic epithelial cell. It is formed from the cells of the basal layer by the transformation of the latter into a foam cell, namely, one with a large nucleus and large nuclear particles and a delicate reticulated protoplasm. At first the cell lies in the rete, and then it retracts from the surrounding cells.

BRUCELLA ERUPTION AMONG VETERINARY SURGEONS: (AN OCCUPATIONAL CONDITION OF THE SKIN PROBABLY ALLERGIC IN NATURE CAUSED BY THE BACILLUS ABORTUS BANG). H. HAXTHAUSEN and A. THOMSEN, Arch. f. Dermat. u. Syph. **163**:477 (July 23) 1931.

The authors describe a skin disease that has affected about 30 per cent of the veterinary surgeons in Denmark. It is characterized by the appearance on the upper extremities of follicular papules, accompanied by pustules and necrosis. The eruption appears soon after the handling of after-births of cows infected with Bacillus abortus Bang, and has a tendency to recur after each exposure. Because of negative cultural experiments with exudate from the lesions and because of positive intradermal reactions with an extract of the bacillus, a so-called "abortin," the authors consider the eruption to be allergic.

THE CHOLESTEROL CONTENT OF BLOOD SERUM IN VARIOUS DERMATOSES AND THE INFLUENCE OF THE ENDOCRINE GLANDS ON CHOLESTEREMIA. S. NEUMARK, Arch. f. Dermat. u. Syph. **163**:556 (July 23) 1931.

Numerous determinations of cholesterol in various dermatoses were made, without uniform results. The author also determined the effect of injections of epinephrine, ergotamine and numerous endocrine products, such as insulin, thyroid, ovarian and testicular extracts, on the cholesterol content of the blood serum. Epinephrine, ergotamine and thyroid usually produced an increase, whereas insulin, ovarian extract in the male and testicular extract in the female produced a decrease. No definite conclusions can be drawn from this laborious and painstaking work, except that the endocrine glands undoubtedly exert some influence on the metabolism of cholesterol.

GENERALIZED ERYTHRODERMAS OF MYCOSIS FUNGOIDES. S. K. ROSENTHAL, Arch. f. Dermat. u. Syph. **164**:82, 1931.

The author divides the erythrodermas found in mycosis fungoides into four classes: (1) a basic type with typical tumors; (2) a leukemic type with a blood picture similar to that of lymphatic leukemia; (3) a pityriasis rubra type, resembling pityriasis rubra of Hebra for many years but finally ending as a mycosis fungoides, and (4) a lymphogranulomatous type.

Rosenthal considers the negative tuberculin tests so often found in mycosis fungoides to be due to a positive anergy, and is of the opinion that the disease constitutes a special type of reaction to a tuberculous infection.

ECZEMAS CAUSED BY FOOD IDIOSYNCRASIES: THEIR DIAGNOSIS, PATHOGENESIS, PASSIVE TRANSFER AND THERAPY. E. URBACH and P. FASAL, Arch. f. Dermat. u. Syph. **164**:133, 1931.

Eczemas caused by idiosyncrasies to food are divided into three classes: (1) Chronic eczemas which are improved or cured either by the withdrawal of the offending food from the diet or by the administration of the corresponding peptone before the meal containing the offending food. As a rule, cutaneous protein reactions are negative in this group, which is dependent on a primary intestinal vascular idiosyncrasy.

(2) Certain cases of diffuse neurodermatitis (corresponding to the late exudative eczematoid of Rost), some of which show a generalized and a cutaneous hypersensitiveness to the nutritive allergen given by mouth. The allergen usually responsible is egg albumin. These types are benefited by intracutaneous therapy but not by the administration of peptones.

(3) Certain cases of children's eczema, corresponding clinically to the exudative eczematoid of Rost. The skin of these children usually reacts positively to egg white, milk or wheat flour. They are improved by intracutaneous therapy.

Groups 2 and 3 are dependent on a primary cutaneous vascular idiosyncrasy.

THE TOXICITY OF THALLIUM IN INFANTS. H. KLEINMANN, Arch. f. Dermat. u. Syph. **164**:181, 1931.

A 9 months old child was given 8 mg. of thallium acetate per kilogram. Toxic nervous symptoms developed from which recovery occurred after three months. The author considers thallium to be more toxic for infants than for older children.

IS POIKILODERMA ATROPHICANS VASCULARIS (JACOBI) A DEFINITE CLINICAL ENTITY? R. GEIGER and J. KONRAD, Arch. f. Dermat. u. Syph. **164**:189, 1931.

The authors consider the disease to be a definite clinical entity and describe a typical case. Therapeutically, they have obtained good results by the use of Grenz rays, resulting in marked clinical and microscopic improvement, the latter demonstrated by a reappearance of elastic tissue in the previously atrophic areas.

MONASH, New York.

FEVER THERAPY IN CONGENITAL SYPHILIS. G. SOEKEN, Arch. f. Kinderh. **92**:216 (Feb. 13) 1931.

The author used fever therapy in thirty-five cases of resistant syphilis. In nine cases the fever agent was blood from patients with recurrent malaria, and in twenty-six cases, blood from patients with tertiary malaria. The dose was from 2 to 5 cc. of blood. The height of the action was six days for the recurrent form, and from four to twenty days for the tertiary. The results were as follows: Of six children with syphilis of the central nervous system, four were clinically improved and five showed serologic clearing. Of seven with bad neurologic symptoms and positive Wassermann reactions, four were clinically improved and six had negative Wassermann reactions. One child who had a return of symptoms was unchanged. Of five children with positive Wassermann reactions three became negative, and of twelve Wassermann-fast cases seven showed improvement.

THE ETIOLOGY OF ERYTHEMA NODOSUM. O. SAXL, Arch. f. Kinderh. **92**:295 (Feb. 13) 1931.

The author found signs of tuberculosis in seven cases of erythema nodosum. He believes that it is a response to a reaction against tuberculosis.

SANFORD, Chicago [AM. J. DIS. CHILD.].

THE IMPORTANCE OF A NEW HISTOLOGIC METHOD FOR THE STUDY OF THE MICROSCOPIC ANATOMY OF THE SKIN. JOHANNES BRODERSEN, Dermat. Wchnschr. **93**:1057 (July 4) 1931.

A new method for fixing and staining tissue is described. Freshly obtained small pieces are fixed in a 2 per cent solution of osmium tetroxide in physiologic solution of sodium chloride. The water used must be freshly distilled in glass, and the sodium chloride should be chemically pure. Frozen sections must be made after embedding in gelatin. The sections are stained in a dilute mixture of methyl

green-pyronin of Pappenheim and new Victoria green and mounted in Brun's solution, which consists of dextrose, 20 cc.; glycerin, 5 cc.; distilled water, 70 cc., and a trace of thymol.

The author describes some of the finer structure of the nerves and sense corpuscles and the process of keratinization as shown by this method.

STUDIES OF THE INFLUENCE OF THE HORMONES ON PIGMENT AND SEBUM ELABORATION. FERDINAND WINKLER, Dermat. Wchnschr. **93**:1261 (Aug. 8) 1931.

Sixty patients with ephelides were given a preparation of suprarenal cortex, some by mouth and others by subcutaneous injection. Improvement was noted within three weeks, especially when the lesions were on the cheeks rather than on the forehead and nose. Preparations of corpus luteum alone had no effect on these lesions, but in combination with suprarenal cortex seemed to be beneficial.

Good results were obtained in acne with corpus luteum preparations. No marked benefit followed the use of suprarenal cortex, but injections of a testicular extract were found to be very satisfactory.

THE PREVENTION OF THE DRYING OUT OF FUNGUS CULTURES. WALTHER KRANTZ, Dermat. Wchnschr. **93**:1263 (Aug. 8) 1931.

The author inserts one end of a piece of glass tubing bent in the form of a U through the cork of the culture tube, leaving the other end open to the air. The cork is sealed with paraffin. Cultures so prepared did not dry out over a period of years.

HORMONAL DERMATOSES OF WOMEN: I. CERTAIN PRECLIMACTERIC AND CLIMACTERIC SKIN REACTIONS. ROMAN VON LESZCZYŃSKI and STANISLAW LIEBHART, Dermat. Wchnschr. **93**:1289 (Aug. 15) 1931.

Nine patients with cutaneous lesions were studied. With one exception, they were all in the climacteric period. Special attention was given to tests of the function of the ovaries, thyroid and anterior lobe of the hypophysis. The predominant skin conditions were pruritus, urticaria and eczematization secondary to scratching. In one instance an eruption similar to herpes gestationis occurred without pregnancy, which was apparently due to a hypofunction of the hypophysis and ovaries. The results of internal gland extract therapy were satisfactory. The necessity for careful tests to determine the status of the various glands is stressed, as well as the importance of using biologically active extracts in the treatment.

ARTIFICIAL DERMATITIS DUE TO GLASS WOOL ("ENGELHAARE"). S. VON SZENTKIRÁLYI, Dermat. Wchnschr. **93**:1302 (Aug. 15) 1931.

A patient is described in whom a dermatitis occurred on the arms and forearms shortly after decorating a Christmas tree with glass wool. The dermatitis was due to the mechanical irritation of the tiny glass splinters in a person unusually sensitive to mechanical irritation.

A FATAL CASE OF EXFOLIATIVE DERMATITIS FOLLOWING TREATMENT FOR PARALYSIS WITH A SUSPENSION OF BISMUTH SALICYLATE OIL AND ARSPHENAMINE. MAX LIEBERS, Dermat. Wchnschr. **93**:1305 (Aug. 15) 1931.

The patient, a man of 57, first received a course of malaria treatment which was apparently well borne. Following this he received a course of bismuth and neoarsphenamine, with a total of 5.25 Gm. of neoarsphenamine. A week after the last dose the eruption started in the flexures and rapidly spread over the body. He died in seventeen days, with clinical signs of cardiac failure. The possible effect of the malaria treatment in decreasing the resistance is discussed.

Death of an Ambulatory Patient Following Lumbar Puncture. Harald Boas, Dermat. Wchnschr. **93**:1309 (Aug. 15) 1931.

Following a lumbar puncture, a paravertebral phlegmon developed which proved fatal. The author points out that every aseptic precaution should be taken in performing this operation, especially in ambulatory patients.

The Development of General and Localized Primary Anomalies of Cornification at the Same Time. Marguerite Friedländer, Dermat. Wchnschr. **93**:1333 (Aug. 22) 1931.

The few cases reported in the literature and one observed by the author in which keratoma palmare et plantaris hereditarium was associated with ichthyosis are reviewed. Both conditions are considered as belonging to the group of nevoid conditions, and whether the one or the other form develops depends on the type and intensity of the damage to the germ plasm. There is no reason why both anomalies may not develop in one person.

A Case of Lichen Ruber Pemphigoides. S. I. Matuskoff, Dermat. Wchnschr. **93**:1340 (Aug. 22) 1931.

A patient is described in whom an eruption developed between the sixth and eighth ribs on the right side of the chest, extending from the nipple to the inferior angle of the scapula in a zoniform arrangement. The lesions had been present for two years and consisted of papules and papulovesicles. Sections showed intradermal vesicle formation, with parakeratosis and a subepithelial infiltrate consisting of lymphocytes and fibroblasts.

Lymphangiectasis with Chylorrhea. Ning, Dermat. Wchnschr. **93**:1389 (Sept. 5) 1931.

The patient first noted the condition at the age of 11 years, at which time a group of vesicles developed on the inner surface of the right thigh which discharged a white fluid at intervals of about fourteen days. The urine was milky at times, but cleared when the cutaneous lesions were discharging. The patient was again admitted to the clinic at the age of 34. There was a considerable swelling of the right leg and thigh which had been increasing for three years, also a good deal of pain. The number of vesicles was increased, new groups having developed at the site of an incision of a furuncle on the hip. Chemically, the fluid proved to be chyle rather than lymph. Sections showed dilatation of the lymph vessels with vesicles in the epidermis. The etiology was apparently an abnormal connection between the chyle and lymph vessels in this region.

Impetigo Herpetiformis Associated with Arthritic Changes. A. Buschke and Adolf Boss, Dermat. Wchnschr. **93**:1394 (Sept. 5) 1931.

A pustular eruption developed following the patient's first and second pregnancies; in each instance the eruption disappeared with the resumption of menstruation. In the fifth month of the third pregnancy, therapeutic abortion was necessary on account of a severe and extensive pustular and crusted eruption associated with fever and arthritis of a number of joints. The condition did not immediately clear up following the abortion. After a few months of treatment with an ovarian preparation, the patient improved sufficiently to leave the hospital. Arthritis deformans remained. The authors consider the case to be one of true impetigo herpetiformis. They cite it as another piece of evidence in favor of the importance of internal gland dysfunction in the etiology, on account of the apparent response to ovarian therapy.

THE INJECTION TREATMENT OF VARICOSE VEINS. ERNST SCHUBERT, Dermat. Wchnschr. **93**:1402 (Sept. 5) 1931.

The author has had success in 80 per cent of his cases, using a 50 to 60 per cent invert-sugar preparation, and advises it as a routine procedure on account of the relative safety.

DISINFECTION EXPERIMENTS WITH HYPHOMYCETES AND YEASTS. E. KADISCH, Dermat. Wchnschr. **93**:1433 (Sept. 12) 1931.

An agar culture of the fungus to be tested was smeared on a small piece of linen. Dipping this in various solutions to be tested proved a satisfactory method of demonstrating the power of disinfection. The resistance of the organism is increased by this method, as the agar protects it to a considerable extent. The resistance depends on the type of organism, the particular culture and the age of the culture. Yeasts are more resistant than hyphomycetes, and Aspergillus niger is more resistant than either. Soaking the material in a 1 per cent solution of thymol in denatured alcohol destroyed the organism in every instance, after a few minutes in the case of hyphomycetes and after a few hours in the case of yeasts. Increasing the amount of thymol caused only a slight decrease in the time necessary. Soaking silk stockings in the 1 per cent solution of thymol for six hours is considered a safe and satisfactory procedure for disinfection.

AN UNUSUAL LOCALIZATION OF ERYTHRASMA. FRIEDRICH DIETEL, Dermat. Wchnschr. **93**:1443 (Sept. 12) 1931.

In addition to a typical eruption of erythrasma in the groins and on the inner part of the thighs, lesions were present on the mesial surfaces of the knees. Microsporon minutissimum was demonstrated in scrapings from these lesions.

POIKILODERMA OF PETGES-JACOBI. P. B. PHOTINOS, Dermat. Wchnschr. **93**:1461 (Sept. 19) 1931.

A woman, 36 years of age, had suffered from a condition of the skin for six months. The eruption started over the chest following a cold and consisted of a network of telangiectasis and pigmentation with some scaling. The face, shoulders, neck and chest were particularly involved. Histologically, the epidermis was thinned, and there was some parakeratosis, with here and there a separation of the epidermis from the corium to form small bullae. In the corium there was an infiltrate consisting of lymphocytes and connective tissue cells, especially around the blood vessels and sweat glands. Mast cells were observed in increased numbers.

ELEPHANTIASIS OF THE MALE GENITALIA. KURT G. STENZEL, Dermat. Wchnschr. **93**:1505 (Sept. 26) 1931.

In a 67 year old man elephantiasis of the scrotum and penis developed following a second attack of erysipelas of the scrotum. The first attack had occurred one and one-half years before.

HERPES SIMPLEX, PARTICULARLY HERPES OF THE HAND. W. FREI, Dermat. Wchnschr. **93**:1508 (Sept. 26) 1931.

The author discusses the article of Fülleborn (*Dermat. Wchnschr.* **93**:1163 [July 18] 1931) in which a recurring vesicular eruption limited to the palm of one hand was described. Fülleborn considered the eruption a probable "creeping eruption," though no causative larva was recovered. Frei points out that herpes simplex may occur on the palmar surface of the hand. He cites two examples that he has observed; he believes that Fülleborn's case may be an example of this condition.

LINEAR LICHENOID ERUPTION FOLLOWING TRAUMA. M. RUITER, Dermat. Wchnschr. **93**:1512 (Sept. 26) 1931.

In a 5 year old girl an impetiginized lesion developed following a traumatic wound of the left index finger. A few days later a lichenoid, slightly pruritic eruption developed, involving most of the back of the hand, the elbow, a linear area on the outer surface of the arm and a similar linear area across the upper part of the back. The forearm was entirely free. The areas involved followed somewhat the distribution of the first thoracic nerve. Biopsy was done, and the sections suggested eczema rather than lichen planus. The eruption cleared up entirely within two weeks.

A FATALITY IN THE COURSE OF THE TREATMENT WITH NEOARSPHENAMINE. J. BRANTS, Dermat. Wchnschr. **93**:1514 (Sept. 26) 1931.

The case history and necropsy findings are reported for a 41 year old woman who died of arsphenamine poisoning. The total dose of neoarsphenamine was 2.55 Gm. given in seven doses over a period of twenty-five days.

THE SERUM DIAGNOSIS OF SYPHILIS BY MEANS OF THE MEINICKE CLEARING AND KAHN REACTIONS, AS WELL AS BY THE CLUMPING REACTION OF MÜLLER. RUDOLF STREMPEL, Dermat. Ztschr. **61**:143 (June) 1931.

It is advisable to check the Wassermann reaction in every case with one of the precipitation tests. Of these, the Meinicke, Kahn and Müller tests are the best known. In the great majority of the 1,003 serums in which these four tests were compared, there was agreement. In 42, there were differences in which the Kahn and Müller reactions were somewhat more sensitive than the others.

THE RELATIONSHIP BETWEEN ALKALI RESERVE AND DERMATOSES. R. FOERSTER, Dermat. Ztschr. **61**:153 (June) 1931.

The alkali reserve of the blood was measured by the titration method and by the volumetric method of van Slyke. The blood of patients with eczema, psoriasis, seborrhea and other skin conditions was tested, as well as that of a group of normal persons. The average values were nearly the same, except that untreated patients with psoriasis showed a slight but definite decrease in the alkali reserve.

ECZEMA, ESPECIALLY INDUSTRIAL ECZEMA, WITH THE CAPILLARY MICROSCOPE. MAX MICHAEL and CHARLOTTE RADEFF, Dermat. Ztschr. **61**:159 (June) 1931.

The authors found approximately the same percentage of abnormal capillary forms in patients with eczema as in noneczematous patients. They studied these changes in the uninvolved areas of the skin. The number of abnormal forms was considerably higher among males than among females.

FEBRILE JOINT DISEASES ASSOCIATED WITH PSORIASIS. T. GRÜNEBERG, Dermat. Ztschr. **61**:170 (June) 1931.

A patient with long-standing psoriasis was observed in whom secondary polyarthritis had developed. During the acute stage, there was considerable increase in temperature, and Staphylococcus aureus (hemolyticus) was recovered from the blood stream. The author discusses the question of psoriatic arthritis in detail.

SYPHILIS ET MORS. A. JORDAN and J. STAROFF, Dermat. Ztschr. **61**:221 (July) 1931.

Between 1921 and 1930, among 2,723 patients treated in the syphilis division of the Moscow Skin Clinic there were 12 deaths. Of these, 2 were from arsphen-

amine poisoning, and 4 were the direct result of syphilis. The remainder occurred in 2 cases of sepsis and 1 each of tuberculosis, erysipelas, Hodgkin's disease and carcinoma.

These figures are compared with those of deaths occurring between 1889 and 1902 among the patients in another service. There were 30 deaths, of which 6 were directly due to syphilis. Eleven were due to tuberculosis. It is likely that the mercury treatment of former times damaged the resistance of the body to infection, while the modern arsphenamine-bismuth therapy does not.

ANIMAL EXPERIMENTS WITH MONILIA FIOCCOI. J. J. ZOON, Dermat. Ztschr. **61**:232 (July) 1931.

Monilia fioccoi is not pathogenic for rats, mice, guinea-pigs or rabbits in that it does not cause inflammatory reactions or metastatic lesions. Infected tissue and small quantities of this monilia culture cause no lesions whatever when injected intraperitoneally. Large amounts of culture suspension are encapsulated in the omentum as foreign bodies, and the organism may remain viable and even multiply for considerable periods.

THE ETIOLOGY OF TRICHOTILLOMANIA. PANAGIOTIS B. PHOTINOS, Dermat. Ztschr. **61**:239 (July) 1931.

The author considers trichotillomania as being merely a bad habit. The best treatment is to clip or shave the area being attacked.

SENSITIZING EXPERIMENTS WITH URSOL. ALFRED MÜLLER, Dermat. Ztschr. **61**:241 (July) 1931.

Repeated applications of paraphenylendiamine sensitized patients to this substance. Passive transmission of this artificial sensitivity was accomplished in a few instances.

MULTIPLE GANGRENE OF THE SKIN ASSOCIATED WITH PERIARTERITIS NODOSA. H. LÖHE and H. ROSENFELD, Dermat. Ztschr. **61**:299 (Aug.) 1931.

A laborer, aged 43, presented a symmetrical eruption involving the face, trunk and upper extremities. The lesions appeared in crops, starting as urticarial wheals that rapidly became bullous, then hemorrhagic and finally dry and necrotic. The complete development of a necrotic lesion occurred in only a few hours. Clinically, the condition resembled multiple neurotic gangrene of the skin. Biopsy revealed an inflammatory condition of the blood vessels of the cutis with secondary thrombosis and infarct formation. The pathologic diagnosis was periarteritis nodosa. It is thought likely that a number of cases previously classified as multiple neurotic gangrene of the skin belong to this group. The coagulation time of the blood was increased to thirty-five minutes with a normal platelet count.

FOLLICULITIS SYCOSIFORMIS ATROPHICANS CORPORIS. PANAGIOTIS B. PHOTINOS, Dermat. Ztschr. **61**:321 (Aug.) 1931.

This extremely rare skin condition is described and discussed in extenso. Six cases have been reported, one of which was previously reported by E. Hoffmann and is the basis of this communication. The eruption consists of a folliculitis which usually occurs symmetrically on the lower extremities, chiefly on the extensor surfaces of the legs. It spreads peripherally, leaving a central atrophy, which may be pigmented. Clinically, the disease resembles the sycosis lupoides of Brocq and the ulerythema sycosiforme of Unna, except for its location. Histologically, there are many plasma cells grouped around the follicles, sweat glands and blood and lymph vessels. In the later stages there is scar formation. The etiology is not known, but in all probability it is associated with changes in the endocrine and vegetative nerve systems.

MULTIPLE BENIGN SARCOID IN A BABY. R. POLLAND, Dermat. Ztschr. **61**:360 (Aug.) 1931.

A 5 months old baby was observed who had about fifteen small nodules scattered over the scalp, forehead, shoulders, arms, chest and inner malleolus of the left ankle. These were moderately hard and chocolate brown, with no tendency toward necrosis. The tuberculin reaction was negative. Biopsy showed pigment granules scattered through the epidermis and corium and round groups of oval and short spindle cells, but no giant or epithelioid cells. The condition cleared with little therapy and is considered by the author to have been multiple benign sarcoid.

PSORIASIFORM ARSPHENAMINE DERMATITIS AND THE INFLUENCE ON THE MORPHOLOGIC FORM OF PSORIASIS OF SPECIFIC TREATMENT FOR SYPHILIS. M. FELLNER, Dermat. Ztschr. **61**:372 (Aug.) 1931.

A patient with latent syphilis received a course of neoarsphenamine and bismuth. Following a total dose of 7.8 Gm., a circumscribed eruption appeared over both elbows. Another dose of 0.45 Gm. of neoarsphenamine was followed by extension of the eruption over the limbs and trunk. This extension was accompanied by intense generalized pruritus. The lesions were indistinguishable from psoriasis. As the eruption cleared spontaneously in a few days, and as there was no recurrence during the next ten months, it was considered to have been a psoriasiform arsphenamine dermatitis rather than an "idiopathic" psoriasis. The literature in regard to psoriasiform and lichen planus like arsphenamine dermatitis is reviewed and discussed.

A second patient presented a typical psoriasis of the scalp and extremities and a serpiginous psoriasiform eruption of the trunk that suggested a tuberoserpiginous syphilid. The Wassermann reaction of the blood was positive. Under specific therapy, the lesions on the trunk improved, but did not clear, while those on the scalp and extremities were unaffected. The eruption cleared under chrysarobin therapy, but reappeared four months later. The course suggested that the patient's latent syphilis influenced the configuration of the psoriasis on the trunk.

THE INFLUENCE OF STARVATION AND THE LIMITATION OF FLUID ON THE POTASSIUM, CALCIUM, CHLORIDE AND WATER CONTENT OF RABBIT SKIN IRRADIATED WITH THE KROMAYER LAMP. F. STERN, Dermat. Ztschr. **61**:384 (Aug.) 1931.

A series of experiments was conducted to determine the variations of the potassium, calcium, chloride and water in inflammatory areas in the skin of starving rabbits. The inflammation was produced by irradiating circumscribed areas with the Kromayer lamp. All values were increased but to a much less degree than in normally fed animals as determined in a previously reported series of experiments.

EXPERIMENTAL INVESTIGATIONS OF LYMPHOGRANULOMA INGUINALE. SVEN HELLERSTRÖM, Dermat. Ztschr. **61**:395 (Aug.) 1931.

The author has succeeded in transferring the virus of lymphogranuloma inguinale by injecting an emulsion of infected human lymph gland into the brains of monkeys. The virus has been shown to be filtrable and withstands glycerin for as long as seven days. A dilution of Frei's antigen has been used intravenously as a curative agent. The injection of this antigen caused a mild rise in temperature, but was otherwise well borne by the patient. This method of treatment has not been used sufficiently to determine its value.

SEROLOGIC STUDIES OF HEALTHY AND SYPHILITIC RABBITS. PANAGIOTIS B. PHOTINOS, Dermat. Ztschr. **61**:400 (Aug.) 1931.

In a group of 112 normal rabbits, positive Wassermann, Meinicke clearing and Meinicke micro-reactions were noted in 7 per cent. In experimental animals with latent syphilis, the reactions were negative, while in those with chancres the reactions were usually positive.

A METHOD OF PREPARING FROZEN SECTIONS OF UNFIXED PIECES OF SKIN DEVISED BY O. SCHULTZ-BRAUNS (IDEAL BIOPSY). E. HOFFMANN, Dermat. Ztschr. **62**:5 (Sept.) 1931.

Schultz-Brauns has devised a microtome knife which can be cooled to —20 C. by means of carbon dioxide gas. This makes the cutting of frozen sections much easier. Sections from 10 to 15 microns thick are readily made with tissue that has not been fixed.

MORBUS PRINGLE, SUBUNGUAL FIBROMATOSIS, PAPILLOMATOSIS CUTIS ET MUCOSAE, AND MOLLUSCUM PENDULUM. N. BUSCH, Dermat. Ztschr. **62**:8 (Sept.) 1931.

A patient presented a typical adenoma sebaceum associated with papillomas of the tongue and gum, pendulous fibromas and subungual fibromatosis. The patient was mentally subnormal. Of the fourteen cases of subungual fibromatosis reported, eleven occurred in females and three in males; in ten instances, the condition was associated with adenoma sebaceum.

ROSACEA AND RHINOPHYMA IN LITERATURE AND ART. FRITZ DIECKMANN, Dermat. Ztschr. **62**:20 (Sept.) 1931.

A brief essay on the appearance of rosacea and rhinophyma in literature and art.

THE FREQUENCY OF SKIN TUBERCULOSIS IN WÜRTEMBURG. W. EDEL Dermat. Ztschr. **62**:31 (Sept.) 1931.

Edel has reviewed the statistics in reference to the occurrence of skin tuberculosis in the University Skin Clinic at Tübingen from 1921 to 1930. He found an increase in the number of tuberculids, while tuberculosis of the skin had decreased. The results of his investigation are plotted in curves.

CHANGES IN THE WALLS OF BLOOD VESSELS IN SEPTIC PURPURA. MARTA FAUSER, Dermat. Ztschr. **62**:36 (Sept.) 1931.

Two cases of purpura, both fatal, were studied histologically. The first occurred with a recurring streptococcic septicemia from a parametritis. The second was one of staphylococcic septicemia from an osteomyelitis. In the streptococcic purpura, the sections of the purpuric areas showed changes in the blood vessels consisting of destruction of the endothelial cells, necrosis of the outer layers of the walls of the blood vessels and formation of small aneurysms, with occasional hyaline thrombi in the lumen.

LINSER'S METHOD OF OBLITERATING VARICOSE VEINS. FRANZ KOCH, Dermat. Ztschr. **62**:46 (Sept.) 1931.

In 1911, P. Linser first used mercuric chloride, 1 per cent in 10 per cent sodium chloride solution, for the obliteration of varicose veins by injection. This method has been used ever since in the Tübingen clinic with satisfactory results. The technic is minutely described by Koch. The only contraindication is the presence of an acute phlebitis with venous thrombosis.

LOCALIZED FAT NECROSIS OF THE NEW-BORN INFANT. KARL LINSER and SOPHIE PÖTSCHKE, Dermat. Ztschr. **62**:53 (Sept.) 1931.

Four cases of fat necrosis of the new-born infant are reported. The condition is due most frequently to trauma, and consists in a necrosis of fat cells with splitting up of the released fat into fatty acids. These fatty acids act as irritants on the reticulo-endothelial system to produce an inflammatory granuloma of the foreign body type. In contrast to the course in adults, the lesions do not tend to break down, rarely calcify and disappear without scar formation. The authors do not consider the condition to be very rare. It appears in the literature under various names.

SUGGESTION IN THE TREATMENT FOR WARTS. ALOIS M. MOMMESHEIMER and E. EISENLOHR, Dermat. Ztschr. **62**:63 (Sept.) 1931.

One hundred and forty patients with warts were divided into two groups. One group was treated by suggestion; the other was untreated. The authors conclude that suggestion can cause warts to disappear, but point out that spontaneous cure occurs in a rather high percentage of the cases.

FIRST ATTEMPTS TO CURE SYPHILIS WITH GOLD. OTTO NAST, Dermat. Ztschr. **62**:69 (Sept.) 1931.

Gold preparations were given intramuscularly to four patients with dementia paralytica and to three with congenital syphilis. This treatment was given in conjunction with other therapy and was apparently of some value.

THE OBLITERATION OF VARICOSE VEINS WITH SCLEROSING INJECTIONS, WITH ESPECIAL ATTENTION TO THE FATAL CASES REPORTED IN THE LITERATURE. ERICH SCHMIDT, Dermat. Ztschr. **62**:76 (Sept.) 1931.

The author discusses the action of the various sclerosing agents that have been used. In reviewing the fatal cases reported, the percentage is found to be considerably less than that following surgical therapy. The possible causes in each case are discussed. Schmidt finds that ligature of the saphenous vein in association with injection therapy increases the likelihood of the formation of a fatal embolus. Pyogenic infections, such as angina and furunculosis, are apt to infect the obliterating thrombus, giving rise to emboli.

PITYRIASIS ROSEA. FRITZ VEIEL, Dermat. Ztschr. **62**:91 (Sept.) 1931.

The author has studied several hundred cases of pityriasis rosea since the war. He finds that spontaneous cure is relatively rare, that pruritus occurs in practically every case, and that a herald patch can nearly always be found if carefully searched for. In a number of instances, the infection apparently occurred as the result of wearing linen which was new or which had hung in a damp place. The condition is considered to be due to an external infection.

L. TAUSSIG, San Francisco.

TREATMENT FOR CONGENITAL SYPHILIS IN INFANCY WITH ACETARSONE BY MOUTH. H. VON METTENHEIM, Med. Klin. **27**:422 (March 20) 1931.

Internal treatment for congenital syphilis, if it is in any way reliable, has certain advantages over the treatment by injections. Von Mettenheim tried acetarsone, the preparation recommended by Levaditi. In this paper he reports only a small series of eighteen cases in which this method was used. The influence on the general condition of the children and also the effect on the central nervous system seem to be encouraging. The dosage varied from 0.01 to 0.25 Gm., depending on the size and age of the child. It is best to begin with

small dosage and increase it gradually. One course of treatment lasted from sixty-three to one hundred and seventy-five days, followed by an intermission. Serologic control of the blood and cerebrospinal fluid is advised as in other forms of treatment. Seven of eighteen cases showed a negative Wassermann reaction after the use of acetarsone in a total amount ranging from 1.5 to 33 Gm. The average total dosage in these cases was 13.3 Gm. For the best results, early treatment is suggested. Early preventive treatment is suggested for all children whose mothers show syphilis in the absence of clinical signs. The length of treatment needed for a complete cure cannot be definitely decided at this phase of the investigation.

EXPERIMENTAL INVESTIGATION ON THE EFFECT OF ACETARSONE IN SYPHILITIC INFECTION OF THE CENTRAL NERVOUS SYSTEM. H. HORSTER, Med. Klin. **27**:511 (April 2) 1931.

White mice were used in the experiments. They were infected in the usual way by the implantation of chancre tissues. Early treatment was started the next day after infection; late treatment, after fifty-six days. Acetarsone was given through a small stomach tube. The dosage was 10 mg. per twenty grams of body weight, ten times a day, every second day. The brains of the animals were tested for spirochetes by injections into other animals. The results show that early treatment, if continued for a sufficiently long time, prevents syphilitic infection of the central nervous system of white mice, and also that through this medication the infection already developed can be cured.

ZENTAY, St. Louis [AM. J. DIS. CHILD.].

BLOOD CHANGES IN SYPHILIS. PAUL NEUDA, Wien. Arch. f. inn. Med. **21**:455 (July) 1931.

The clinical experience of the tolerance of the syphilitic patient to iodides points to a possible qualitative change in the body fats brought about through the influence of the infection. Chemical analysis of the blood fat in both normal and syphilitic persons seems to substantiate this conception. In the syphilitic patient a relatively and absolutely increased content of phosphatides as compared with the total fat was consistently found. In some cases a marked increase of total fat was found. The determination of the iodine number gave a high increase in unsaturated fatty acids in the syphilitic patient. Both of these findings are important, since there is a definite interdependence between these factors. Any marked qualitative change in blood fat predisposes to the increased formation of unsaturated fatty acids.

SCHLUTZ, Chicago [AM. J. DIS. CHILD.].

THE GERSON-HERRMANNSDORFER-SAUERBRUCH DIET IN DIFFERENT FORMS OF TUBERCULOSIS IN CHILDREN. O. WIESE, Ztschr. f. Kinderh. **51**:119 (May) 1931.

Wiese used the Gerson-Herrmannsdorfer-Sauerbruch diet in its exact form, confusion having arisen as to its value because investigators modified it in one way or another. He reports the cases of forty-six children who remained on this schedule from four months to one year. There was no convincing effect on skin tuberculosis, and in the most suitable cases of bone tuberculosis the patients refused to take it. The result in pulmonary tuberculosis was poor. The diet is not without danger, because of its content of phosphorus. Recognition depends on whether it offers more in a shorter time than other diets, and this it does not do. Wiese's experience is in accord with the experience of other workers.

Society Transactions

MANHATTAN DERMATOLOGIC SOCIETY

M. B. Parounagian, M.D., *Secretary*

Oct. 13, 1931

George M. MacKee, M.D., *Chairman*

Scleredema Neonatorum. Presented by Dr. Benjamin Ochs.

A. B., aged 4 months, presented hard plaques in the skin on both buttocks. The lesions varied in size from that of a bean to that of a palm and were not painful. They developed two weeks after birth, and had grown slightly larger. The skin was tense and drawn, and was apparently thinner than on other parts of the body. The Wassermann tests of both the patient and the mother were negative.

DISCUSSION

Dr. E. W. Abramowitz: I have seen a few cases of sclerema neonatorum, one in my service at the Israel Zion Hospital of Brooklyn. This child was treated with the roentgen rays and recovered; but, judging from what I have seen in other cases, I believe that such patients get well spontaneously, without any special treatment. Usually there is a history of some trauma, either during or after delivery, which seems to have altered in some manner the chemical constituents of the adipose tissue.

Dr. Benjamin Ochs: I agree that some of these patients get well spontaneously. If at first the disease does not progress to a severe degree, I think one can give a good prognosis. I have seen two cases in which the disease progressed very rapidly and came to a fatal ending.

Phagedenic Ulcer. Presented by Dr. David Satenstein.

M. M., a girl, aged 10 years, was admitted to the Medical Center of Jersey City on March 17, 1931, at which time she had an ulcerated area near the left axilla about 2 inches (5 cm.) in diameter. The patient had had furuncles for two months previous to examination. About two months after admission there appeared a superficial fluctuating area just to the left of the sternum, which was incised and drained. The area slowly became necrotic and sloughed.

There were two large areas that were ulcerated down to the muscle; one covered the entire flexor surface of the left arm and the second extended from the left margin of the sternum almost into the axilla. The edges were undermined, and the base showed some granulation tissue and considerable purulent discharge. The general condition was found to be normal. Repeated roentgenograms of the chest were negative. The Wassermann test of the blood was normal, and the past and the family histories were unimportant. Cultures were negative. Inoculation of animals and examination for diphtheria bacilli gave negative results. There were no gonococci. Examination of the stools for amebas was negative. Microscopic examination of excised tissue showed granulation tissue only. The patient was treated with all types of surgical dressings and with sunlight.

DISCUSSION

DR. ANDREW GILMOUR: I suggest that the child's general health be built up by means of outdoor life and food.

DR. M. B. PAROUNAGIAN: I cannot suggest anything regarding the diagnosis, but as to treatment, I should suggest the administration of neoarsphenamine, cauterization of the edges with a 10 per cent solution of silver nitrate and the application of a 10 per cent balsam of peru in castor oil, and perhaps at night wet dressings of a solution of mercuric chloride 1 : 10,000.

DR. ISADORE ROSEN: I have seen two similar cases during the past few years in which all pathologic and bacteriologic studies failed to reveal a definite etiologic factor, I suggest cauterization of the ulceration with the pacqueline cautery to at least 1 inch (2.5 cm.) outside of the active process. This should be followed with wet dressings of solution of sodium chloride with daily prolonged exposures to the heat from an electric bulb.

DR. DAVID L. SATENSTEIN: The tuberculin test was negative. A number of injections of antimony and potassium tartrate had been given with no results. The edges had been cauterized with no results. Dr. Stewart of the Post-Graduate Hospital suggested tuberculosis as the diagnosis, but inoculation of animals for tuberculosis gave negative results.

LUPUS ERYTHEMATOSUS DISSEMINATUS. Presented by DR. ISADORE ROSEN.

F. S., a man, 38 years old, born in the United States, was seen at the dermatologic clinic of the New York Post-Graduate Hospital on Sept. 18, 1931. The patient presented a generalized, erythematous maculopapular eruption, which had been present for a few weeks. The clinical diagnosis was dermatitis medicamentosa due to ingestion of a drug that the patient had been taking for headaches.

In the course of the examination it was found that the patient had another disease. There were lesions of lupus erythematosus disseminatus, which had been present for about two years. These lesions were mostly on the back, extending from the lower angle of the scapula and covering the sacral regions. They were in various stages of development. The features of lupus erythematosus were definite — erythema, follicular, adherent scales and distinct atrophy. The ears showed similar involvement. The palms, especially, showed erythematous, telangiectatic and atrophic lesions.

The interesting feature in this case was that the patient had been employed as a printer for six years. Was there any connection between his occupation and the lupus erythematosus disseminatus? A similar case had been shown at the dermatological section of the New York Academy of Medicine a few weeks prior, which occurred in a man who was also employed in a printing establishment.

DISCUSSION

DR. LOUIS B. MOUNT: While the man may have had the discoid type of lupus erythematosus, the disseminate type is now developing.

DR. E. W. ABRAMOWITZ: This patient is quite ill. In addition to the lupus erythematosus on the back, he has pernio-like lesions on the finger tips and urticarial lesions on the arms. The manifestations on the skin are an expression of a systemic disease, the nature of which should, if possible, be determined. The treatment should be governed by the clinical and the laboratory findings.

DR. PAUL BECHET: I agree with Dr. Abramowitz that this man is very sick, and that he is suffering from severe generalized toxemia. The case is a most interesting one. If gold thiosulphate is administered, it should be given in extremely minute doses, as a severe reaction, in the patient's present state, might easily prove fatal.

DR. GEORGE C. ANDREWS: I should like to report the case of a man who had the disseminate type of lupus erythematosus and had lost 40 pounds (18.1 Kg.). I placed him on the Gersten-Sauerbruch diet, and in two months he gained 12 pounds (5.4 Kg.) and the lupus erythematosus, which had been present for four years disappeared. The patient received no other treatment except cold compresses of boric acid applied to the face and hands and rest at home.

ECZEMATOID DERMATITIS. Presented by DR. PAUL BECHET.

E. G., a girl, aged 19, stated that the eruption first made its appearance at the age of 12 years, immediately following appendectomy. She came under observation in 1927, and at that time had an extensive weeping, scaly, bright red, infiltrated, chronic, eczematoid eruption, covering the scalp, arms and neck. It was not seborrheic and was intensely pruritic. Several years later the clinical picture assumed the characteristics of that of a neurodermatitis. The results of chemical examination of the blood and of differential counts, as well as of repeated examinations of the urine were normal. The last chemical examination of the blood showed: sodium chloride, 495 mg.; sugar, 112.5, mg.; urea nitrogen, 15.4 mg.; uric acid, 3.08 mg.; solids, 20.2 per hundred cubic centimeters. There was 0.07 mg. of arsenic per hundred grams of solids. The urine showed 0.04 mg. of arsenic per hundred grams of solids. The patient had been under observation continuously for four years, and in that interval had been given as much roentgen treatment as was commensurate with safety. During roentgen treatment she had received locally only a cream of wool fat or boric acid ointment. In the intervals between roentgen treatments, oil of cade, Lassar's resorcinol paste, salicylic acid, and ointments in various strengths, containing sulphonated bitumen, solution of coal tar N. F., calamine and zinc had been used. Weak crude coal tar and pyrogallol triacetate were used. Sodium thiosulphate was administered intravenously. Intramuscular injections of nonspecific proteins were given. Various vaccines were injected intradermically and subcutaneously. Ultraviolet radiation was applied. Internally, various combinations of endocrine glands were administered, together with alkalis, calcium and mild laxatives. Dietetically, foods low in protein and high in vitamins were allowed. Various activated cod liver oil preparations were taken. None of this therapy was used to excess, nor was any local treatment allowed to cause more than a transient dermatitis. While the patient had improved enormously, the skin was still far from normal, and considerable eruption remained. The case was shown because of the patient's unusual resistance to treatment and in the hope of therapeutic suggestions.

DISCUSSION

DR. E. W. ABRAMOWITZ: My impression is that the patient is allergic. By patch tests and other methods it may be possible to ascertain the reason for the persistence of the eruption.

DR. DAVID L. SATENSTEIN: I do not believe that one can accomplish much with local therapy only; at times it is necessary to change the character of the food, the environment and even the occupation of these patients. My experience has been that in the majority of instances, the patients with these recurrent cases are overtreated; at times the mildest type of local treatment gives the best results.

DR. ANDREW GILMOUR: I think that if there is some way to prevent the patient from scratching the eruption it would help a great deal.

DR. GEORGE C. ANDREWS: I am inclined to think that the cause of the condition is internal instead of external.

DR. GEORGE M. MACKEE: In my opinion this is a case of neurodermatitis disseminata and such a case should be investigated from three angles, namely, the endocrinologic, the neurogenic and the immunologic. From a practical standpoint an endocrinologic examination is seldom of value, but at times it is very helpful. The neurogenic factor is exceedingly important, but it has been stressed

sufficiently by the previous speakers. It embraces rest, exercise, change of environment, psychoanalysis, etc. I shall confine my remarks to a brief discussion of the immunologic factor. The disseminate type of neurodermatitis, as I understand it, is atopic; that is, the patient is born with a tendency to become allergic. Often there is a personal or family history of hay fever, asthma, urticaria or neurodermatitis. Incidentally, many of these patients have mild ichthyosis of the legs, which is suggestive of congenital anomalies due possibly to endocrine dysfunction in the parents. To return to the immunologic factor, these patients only occasionally give positive reactions to patch tests, apparently only when the exacerbations resemble dermatitis venenata and owing to local contact with substances to which they are sensitized. Frequently they give positive reactions to one or many substances by the scratch and intradermal tests. While it must be admitted that immunologic studies and attempts at desensitization are disappointing, yet brilliant results are obtained occasionally. Especially is this so when the eruption is due to a substance that can be determined, and that the patient can avoid. I could report many interesting and instructive cases, but I shall mention only a few. One patient was allergic to many substances, including horse dander; when she remained away from horses her skin was normal. In another patient with a case exactly similar to the one just mentioned, hay fever developed when she was near a horse, but horse dander had no effect on the cutaneous exacerbations. In both instances the particular allergen was specific, the shock center in the first case being in the upper respiratory tract and in the second case in the skin. Several patients gave positive reactions to silk but were not benefited by avoiding contact with that substance. Many patients are allergic to substances from which it is impossible to avoid contact, such, for instance, as dust. However, occasional spectacular results warrant a comprehensive modern immunologic study of these patients.

DR. PAUL BECHET: I also am of the opinion that the etiology in the case is associated with allergy. That the cause is exogenous is not borne out by the facts of the case, as the patient has frequently had a complete change of environment with no effect whatever on the cutaneous disease. That some article of food might be responsible is plausible. I did not test her skin with food substances, but I varied her diet in every way, with entirely negative results. Endocrinotherapy was equally disappointing.

This type of case occurs so frequently in practice and the condition is so difficult to relieve that I feel that the presentation of this case is justified.

PSORIASIS RESEMBLING DERMATOPHYTOSIS. Presented by DR. GEORGE C. ANDREWS.

S. B., a youth, aged 18, for three years had had a scaling, erythematous eruption on the hands and the feet. The lesions began first on the feet and later appeared on the palms and the webs of the fingers, particularly between the index fingers and the thumbs. The condition had been symptomless except for the scaling and redness. There was no oozing or blisters. The eruption appeared nowhere else on the body, although at times there were small red spots on the elbows. The scalp was clear, except for occasional dandruff. The patient was in good general health. The Wassermann test was negative. Microscopic examination for fungi gave negative results. The patient was treated with ointments and the roentgen rays.

The lesions were distributed over the soles and between the toes and the fingers. Those on the soles were circumscribed, scaly and brownish red; between the toes the epithelium was macerated and peeling. Between the fingers there were erythematous, well defined, scaly patches. The scales on all areas were micaceous, and when removed left fine bleeding points. On the lower lip there was a dry, scaly patch that extended over the left half of the vermilion surface. On the occipital region were two small, red, scaly patches.

Biopsy: The section showed marked hyperkeratosis with prominent areas of parakeratosis. The granular layer showed definite increase in width. The epithelium showed interstitial edema and acanthosis. The superficial corium was edematous; its capillaries were dilated, and about them the fibroblasts were increased. A few lymphocytes were also present. The picture was not inconsistent with that of psoriasis.

DISCUSSION

DR. DAVID L. SATENSTEIN: Most of the section showed a well marked and part an increased keratogranular layer; a few of the papillary bodies were edematous, and over the edematous papillary bodies there was some parakeratosis. There were slight dilatation of the vessels of the upper cutis and a sparse cellular infiltration.

The microscopic evidence was not that of psoriasis; it was more suggestive of a long-standing neurodermatitis.

DR. E. W. ABRAMOWITZ: The resemblance between psoriasis and the chronic scaling type of dermatophytosis is so close at times that it is impossible to differentiate them. One is also confronted with the fact that it is possible for a patient to have psoriasis and dermatophytosis also. Dr. Andrews' patient seems to have psoriasis of the hands, but the lesions on the toes may be either psoriasis or dermatophytosis. Additional cultures of the scales between the toes should settle the diagnosis.

DR. GEORGE C. ANDREWS: I do not know whether or not the histologic condition might have been affected by the roentgen treatment the patient had before the biopsy was taken. The histology of psoriasis varies considerably according to the location and duration of the lesions. I do not believe that the histologic condition in this case is inconsistent with the diagnosis of psoriasis. The biopsy material was taken from the instep, an unusual place for a biopsy to be made in psoriasis.

FIBROSARCOMA (?). Presented by DR. FRED WISE.

S. R., a girl, aged 11 years, applied at the Post-Graduate Skin Clinic for advice regarding a lump in the midarea of the outer surface of the right arm, near the insertion of the deltoid muscle. Examination revealed a deep-seated subcutaneous tumor about 2 inches (5 cm.) in length and 1 inch (2.5 cm.) in width, over which the skin was faintly purple and somewhat bound down and depressed. The consistency of the tumor was that of a soft rubber ball. There was no pain, but there was tenderness on pressure. The duration of the lesion was said to be a year. There were no other abnormalities. The lesion was to be excised and studied microscopically.

DISCUSSION

DR. FRANK FRASER: In my opinion the case is one of neurofibroma.

DR. LOUIS B. MOUNT: I agree with Dr. Fraser that the diagnosis should be neurofibroma.

DR. ANDREW GILMOUR: Neurofibroma is my diagnosis.

DR. E. W. ABRAMOWITZ: Is there any history of injury in this case? Has the patient received an injection in this area? It is necessary to exclude paraffinoma. The diagnosis of the lesion that this patient presents will probably be settled by microscopic examination of the excised growth.

LUPUS VULGARIS. Presented by DR. BENJAMIN OCHS.

N. M., a man, aged 45, presented on the right cheek a plaque of lupus vulgaris extending from the angle of the mouth over the entire cheek. The condition had

been progressive and was at least of thirty years' duration. When the patient was first seen, the entire edge of the lesion was studded with apple-jelly nodules. The nodules were destroyed with phenol. The cosmetic result was excellent.

A Case for Diagnosis (Lymphoblastoma?). Presented by Dr. Isadore Rosen.

C. S., a white man, 70 years old, born in the United States, married and unemployed, presented himself at the New York Post-Graduate Hospital on June 16, 1931, with generalized erythema covering almost the entire body, of six weeks' duration. Scattered over the forearms were areas of a paler hue. A moderate amount of lichenification was present on the chest. Both legs showed edema and pitting on pressure.

The palms and soles showed no definite clinical changes, and there were no follicular plugs on the backs of the fingers and hands. There was no history or evidence of a previous psoriasis. The patient had been applying sulphur ointment because of burning and itching of the skin. Urinalysis gave negative results; no arsenic was found. The differential blood count was normal.

On Oct. 12, 1931, the patient returned to the hospital with the following condition: The skin was red and infiltrated, with many small infiltrations varying in size from that of a pea to that of an almond and marked general adenopathy. The patient complained of chilly sensations following which he felt feverish.

The blood count showed: red blood cells, 3,460,000, and white blood cells, 25,400; with polymorphonuclears, 19; large lymphocytes, 23; small lymphocytes, 50; mononuclears, 5, and eosinophils, 2 per cent.

DISCUSSION

Dr. Fred Wise: There is a striking resemblance to pityriasis rubra of Hebra. I believe that as the disease progresses, the skin will become glazed and atrophic.

Dr. Louis B. Mount: The condition in this case resembles Kaposi's lymphodermia perniciosa, which falls in the group now called lymphoblastoma.

Dr. W. Wallhauser: I should favor the diagnosis of leukemia on account of the nodules present.

Dr. H. J. F. Wallhauser: It is extremely difficult to classify these cases of continued primary inflammation of the skin, especially in the early period as in the case presented. Hebra's type of lesion was mentioned, but it would seem that this variety could be excluded by the more acute onset and infiltration as compared to the dry, scaly pigmented patches with a generalized erythema described by Hebra. Further observation will be necessary for diagnosis.

A Case for Diagnosis (Syphilis; Dermatitis Venenata?). Presented by Dr. J. Frank Fraser.

G. O., aged 49, a Negro, a porter by occupation, was first seen at the dermatologic service at the Broad Street Hospital on July 24, at which time he presented an eruption involving the back and the sides of the neck. This was vesicular with considerable erythema. A diagnosis of dermatitis venenata was made, and the patient was treated with dressings of boric acid and calamine lotion. A Wassermann test was made at that time, and when the patient was again seen on July 31 the dermatitis venenata had responded well to treatment. The Wassermann reaction was one plus and the Kahn reaction was four plus. Physical examination gave negative results, except for a slight nystagmus on lateral deviation of the eyes. The patient then received two injections of bismuth (2 grains [0.13 Gm.] each) and two injections of neoarsphenamine (0.45 Gm.).

On August 27 the patient presented a papulosquamous eruption involving the extensor surfaces of the arm, thighs and scalp. The scale was dry and had a silvery appearance. Following this he received four more injections of bismuth.

MINNESOTA DERMATOLOGICAL SOCIETY

D. D. TURNACLIFF, M.D., *Secretary*

Oct. 13, 1931

C. A. BOREEN, M.D., *President, in the Chair*

BLASTOMYCOSIS. Presented by DR. C. D. FREEMAN.

The patient first came under my observation in 1927, at which time the entire left cheek, the left side of the nose and the region about both eyes were involved; the disease had started in 1925. The crust-covered papillomatous lesions exuded a seropurulent fluid. Blastomyces were found. Under roentgen treatment and the administration of iodides and neoarsphenamine all the lesions healed entirely, except those in the region about the eyes, which were rapidly improving. A biopsy was performed.

DISCUSSION

DR. C. D. FREEMAN, St. Paul: Is neoarsphenamine of value in blastomycosis? Has any one treated patients with blastomycosis with neoarsphenamine alone to ascertain its real value?

DR. L. A. BRUNSTING, Rochester: The involvement of the sclerae is certainly a rare manifestation of blastomycosis. The nodules grouped at the inner canthus of the right eye might be treated with carbon dioxide snow. When all activity of the process has subsided, plastic repair could be undertaken. We have used neoarsphenamine for its tonic effect, without particular enthusiasm being aroused concerning its specific effects on the blastomycosis. The iodides are given in large dosage, more or less empirically, and in some persons the condition improves without them. The intravenous administration of compound tincture of iodine has no particular merit, and it promptly obliterates the veins.

DR. C. D. FREEMAN: One must be cautious in using carbon dioxide snow following radium therapy as it may result in extensive destruction of tissue. I do not know just what deleterious effects carbon dioxide snow would have on a skin previously exposed to several suberythema doses of roentgen rays; probably none.

DR. L. A. BRUNSTING: Pusey has called attention to the fact that reactions from the use of carbon dioxide snow are much more vigorous when there has been previous roentgen or radium therapy.

ERYTHEMA INDURATUM. Presented by DR. JOHN F. MADDEN.

Mrs. E. B., aged 66, a housewife, stated that an eruption had appeared on the calves of her legs one year previous to presentation. The lesions appeared as deep-seated, painful, bright red, dime-sized nodules which progressed to central necrosis, ulceration and healing. An atrophic scar remained at the site of previous lesions. The Mantoux test was strongly positive. A biopsy showed a typical tuberculoid structure. This case and the following ones presented by Dr. Madden were from the service of Dr. Klein and Dr. Madden at Ancker Hospital, St. Paul.

LICHEN PLANUS. Presented by DR. JOHN F. MADDEN.

L. L., a hospital orderly, aged 24, about four months previous to presentation had first noticed an eruption confined to the shaft and glans of the penis. The condition was asymptomatic, except for slight itching at times. The lesions were pinhead-sized, angular, violaceous, flat-topped or umbilicated papules which exhibited a metallic sheen when viewed in tangential light. They were all about the same size. The patient did not consent to a biopsy.

DISCUSSION

DR. H. E. MICHELSON, Minneapolis: I think this is a case of lichen nitidus of Pinkus. The uniform size of the lesions, the color and the location lead me to that diagnosis. Biopsy is essential for verification.

DR. L. A. BRUNSTING, Rochester: The lesions resemble those of lichen planus, while a few on the glans have the umbilication of those of molluscum contagiosum.

NEUROTIC EXCORIATIONS. Presented by DR. JOHN F. MADDEN.

Mrs. H. S., aged 64, a housewife, stated that she had had cutaneous disease for the past twenty years. She stated that the pruritus appears first, then she excoriates the site of the itching, and the present eruption follows. The type of lesions has been the same for twenty years. At present she has a generalized eruption, which is more marked, however, on the extremities, the upper part of the back, the neck and the face. This eruption consists of discrete, excoriations, ranging in size from that of a pea to that of a bean, in various stages of involution. Atrophic scars mark the sites of previous lesions. A biopsy shows a mild inflammatory reaction.

DISCUSSION

DR. J. F. MADDEN: This case has been seen by four or five of the members present at various times during the past twenty years. I should like to have their opinion as to whether the condition has changed since they last saw it.

DR. C. D. FREEMAN: My impression is that this case is one of prurigo nodularis.

DR. H. E. MICHELSON: I think that the patient has prurigo nodularis. I should try very mild fulguration.

DR. S. E. SWEITZER, Minneapolis: In prurigo nodularis the lesions are usually more definite, and the tops of most of them are covered with ordinary skin slightly roughened. In the case presented, many of them look inflammatory; they are larger than those of prurigo nodularis, and are red. I should classify this case as one of chronic urticaria with excoriations. Etiologically, the condition may be prurigo nodularis, as the cause of neither condition is known, but clinically it does not resemble other cases of prurigo nodularis that I have seen.

SECONDARY SYPHILIS (PUSTULAR, ANNULAR AND CORYMBOSE LESIONS). Presented by DR. JOHN F. MADDEN.

C. A., aged 19, a Filipino laborer, first noticed a generalized eruption four months prior to presentation. He presented a penile lesion six months previously. At this time he has a generalized eruption consisting of pustules ranging in size from that of a pinhead to that of a pea associated with corymbose papular lesions. There are annular lesions about the face. The Wassermann reaction of the blood was 4 plus.

DISCUSSION

DR. F. R. WRIGHT, Minneapolis: The only question about the case would be the age of the infection. If a man becomes infected with syphilis, the initial lesion appears in three weeks. Between the twenty-eighth to the thirty-fifth day, the glands of one groin become enlarged, and from the thirty-fifth to the forty-eighth day, the glands of the other groin become enlarged; so that if he has an initial lesion and glands in both groins, the infection is six weeks old. By the forty-ninth day, the cervical glands are enlarged; general eruption occurs about the fifty-sixth day. From this time on relapses occur in periods of about three months, so that patients go to their physicians after three weeks, two months, five months, eight months or twelve months.

The patient presents grouped papular eruptions on various parts of the body and also moist papules around the anus, which do not appear before the ninth month; therefore, the infection in this case is at least nine months old.

ANNULAR, PAPULAR TERTIARY SYPHILIS. Presented by DR. JOHN F. MADDEN.

M. P., aged 64, a ward maid, was presented at the meeting of this society in April, 1931, as having a case of annular, tertiary syphilis. At that time considerable discussion took place as to whether or not the case was an example of erythema centrifigum. The eruption involuted following four weekly injections of neoarsphenamine.

SECONDARY SYPHILIS (CONDYLOMATA IN INTERDIGITAL WEBS). Presented by DR. JOHN F. MADDEN.

C. M., aged 27, a laborer, presents an involuting penile chancre. There is a syphilitic alopecia, marked leukoderma coli and a generalized papular eruption involving the palms and soles. The patient also presents mucous patches in the mouth. There are condylomas on the scrotum, the perineum, the perianal region and between all of the toes. The Wassermann reaction of the blood is 4 plus.

NODULOULCERATIVE TERTIARY SYPHILIS. Presented by DR. JOHN F. MADDEN.

J. G., aged 24, a Negro laborer, four months before presentation first noticed an eruption consisting of dime-sized, confluent, painless nodules on the middle third of the calves of both legs. The nodules soon broke down and ulcerated; they were present as polycyclic ulcers. The patient had a penile chancre four years previously. The Wassermann reaction of the blood is 4 plus.

BRONX DERMATOLOGICAL SOCIETY

THEODORE ROSENTHAL, M.D., *Secretary*

Regular Meeting, Oct. 15, 1931

HENRY SILVER, M.D., *Chairman*

VON RECKLINGHAUSEN'S DISEASE (FORME FRUSTE). Presented by DR. SAM FELDMAN.

P. S., a white boy, aged 11, born in the United States, was admitted to the Morrisania Hospital, for loss of weight, irregular temperature and pigmented spots on the body. The past history was irrelevant. The child's father also had pigmented macular areas on the back.

Several large yellowish-brown areas were noted on the trunk. These areas had persisted since birth, and similar lesions appeared from time to time, always on the trunk.

Physical examination revealed an enlarged spleen. The entire skin had a pallid hue. There were numerous macular brownish lesions, ranging in size from that of a pinhead to from 4 to 5 cm. in diameter, localized mostly on the trunk, with only a few on the face. No fibromas were present. The blood count showed a secondary anemia, with 7 per cent eosinophils. Roentgen examination disclosed an area of lessened density of the femur. The sella turcica was normal. The blood cholesterol was 200 mg. The blood pressure taken on the right arm was 108 systolic and 22 diastolic, and on the left arm, systolic 116 and 58 diastolic. The Pirquet and Schick tests were negative.

DISCUSSION

DR. I. ROSEN (by invitation): Clinically, this case resembles the mild type of von Recklinghausen's disease that is occasionally encountered. The presence of the large number of café au lait and pigmented lesions without tumors is sufficient to place this case into the forme fruste type of this disease.

In a small series of patients suffering from this disease we found an increase in the cholesterol content of the blood.

DR. C. WOLF (by invitation): There are clinical signs in this patient that indicate that he has some other disease. He has a large spleen, which may be mistaken for a tumor of the kidney or a hypernephroma. Whether the patient has more than one disease remains to be seen. I was of the opinion that the condition was von Recklinghausen's disease, but on further thought I feel that there is a constitutional condition, such as Addison's disease or hypernephroma.

DR. I. M. LASHINSKY: I should like to know how one can explain the scaling of some of the lesions?

DR. S. FELDMAN: The scaling may be accounted for by the associated seborrhea. Clinically, the picture is that of von Recklinghausen's disease of the fruste variety. The pigmentation is of the café au lait color. There are several additional interesting features in this case. The patient has an enlarged spleen; the liver, however, is not enlarged. There is a marked discrepancy in the blood pressure on both sides of the body, 116 systolic and 20 diastolic on one side and 108 systolic and 58 diastolic on the other. I think that we are dealing with von Recklinghausen's disease associated with a tumor of the sella or one in the abdomen.

A CASE FOR DIAGNOSIS. Presented by DR. WILBERT SACHS.

M. M., a girl, aged 10, for two months prior to admission had had repeated attacks of furuncles in the left axilla. About four months later, a superficial fluctuating mass appeared to the left of the sternum; this area was incised and drained. The region slowly became necrotic and commenced to slough away.

At present there are two large areas, one covering the entire flexor surface of the left arm, and the other, the left anterior region of the chest, near the axilla, which have sloughed down to muscle. There is considerable purulent discharge, and the edges of the lesions are undermined. There is little healthy granulation tissue to be seen.

Roentgenograms of the chest were negative; repeated examinations of the urine were negative. Cultures and the inoculation of guinea-pigs proved negative. A complete physical examination of the child showed nothing of interest. The Wassermann reaction of the blood was negative, and the blood count showed moderate leukocytosis. Biopsy disclosed granulation tissue. Several smears of the wound were negative for diphtheria bacilli and gonococci. The stools were negative for amebas. Treatment consisted of various types of antiseptic dressings, exposure to sunlight and applications of lactic acid.

DISCUSSION

DR. L. CHARGIN: The possible diagnoses to be considered are tuberculosis and a chronic pyogenic infection. I should say that tuberculosis is more likely, but that further study is required to determine the condition.

DR. C. LERNER: It is natural to think of tuberculosis in lesions of this type. So far as therapy is concerned, I should suggest that Dr. Sachs try a 20 per cent solution of peroxide. I do not know whether light therapy has been tried. I believe that good results may be obtained with ultraviolet rays. I find that

after a 20 per cent solution of peroxide is used for a short while and then small doses of carbon arc irradiation are given, the results are better. Carbon arc light approaches sunlight more than does the mercury quartz light.

DR. H. SILVER: The case falls in the group of chronic pyodermias. As for the therapy, it is not so much a question of the organism that causes the destruction, but of the soil. The resistance of the patient is reduced. All therapeutic resources should therefore be directed to improve the patient's resistance, by general treatment with light, vaccine, blood transfusion, etc.

DR. I. M. LASHINSKY: On purely empiric grounds, antimony and potassium tartrate would be of great value, since it is so effective in many types of obscure infections.

DR. C. WOLF: The most important thing in this case is the diagnosis. In finding out what it is, a great deal will have been done toward a cure. The pectoral muscles are destroyed, in parts, so that one can almost see the ribs. There is a fulminating destructive disease. I think that the use of ultraviolet light is a very good idea, but I should like to stress the importance of making a diagnosis. I think that new specimens should be taken and further investigations made.

DR. N. SOBEL (by invitation): I was fortunate enough to see a case similar to this in Jadassohn's clinic about two years ago. The lesions were smaller and the duration was one year. Repeated examinations, carefully made, gave absolutely negative results, and no diagnosis could be established.

DR. S. FELDMAN: I want to point out that there is a difference in using a carbon arc lamp and a quartz lamp. A carbon lamp gives a long powerful ultraviolet ray, and the patient can be exposed from four to five hours at a time with correspondingly good results.

DR. F. A. DIASIO: Maggots might be tried in this case. In the recent literature, reference is made to its use in cases of severe osteomyelitis, with good results.

DR. W. SACHS: All the laboratory tests have been made again and again. I feel that the girl has been getting better during the last two weeks. She has had treatment with ultraviolet rays, peroxide and lactic acid. Since she has been walking around she has gained weight, and the lesions are less marked.

PEMPHIGUS VULGARIS. Presented by DR. SAM FELDMAN.

J. C., a man, aged 58, first seen on Dec. 1, 1930, presented an eruption that was located on the face, upper part of the arms and the uppermost portion of the back. The lesions were bullous, starting on an unmistakably noninflammatory base, varying in size from that of a pea to that of a hazelnut. They appeared in crops, and were of rather tense texture; there was no odor to the broken bullae and no tendency toward turbidity. There were no lesions in the mouth. This condition persisted until March 10, 1931, when the character of the lesions changed, and numerous papules capped by inflammatory vesicles appeared on the arms and forearms, especially on the flexor surface. On the right forearm were several lesions, flat, angular and shiny, but not vesicular. Two large recently broken bullae on a noninflammatory base were seen on the back. The Nikolsky sign was negative. The potassium iodide patch test was negative. The Pels-Macht phytotoxin test for pemphigus was positive.

DISCUSSION

DR. C. LERNER: There seems to be some benefit in vaccinating if it is done early in the course of the disease.

DR. S. FELDMAN: This suggestion was made to me about two years ago. I vaccinated two patients. One of them showed marked improvement but later a relapse occurred.

REINFECTION. Presented by DR. I. M. LASHINSKY.

M. D. P., a man, aged 41, an Italian, a cabinet-maker, came to the Mount Sinai Clinic, on March 15, 1919, presenting a healed lesion with the typical induration of a chancre. A few scattered macular and maculopapular lesions were found on the body. The Wassermann test of the blood was negative. Until December 30, the patient received six injections of arsphenamine and four of mercuric salicylate. The Wassermann reaction remained negative.

On July 3, 1920, the patient returned. At that time he presented a pea-sized, indurated lesion on the penis behind the corona; the lesion was raised and follicular, with a purulent discharge. He had been exposed three weeks previously. Four days later, an examination for spirochetes gave positive results, while the Wassermann test of the blood was negative.

From July 7, 1920, until Feb. 5, 1921, he received fourteen injections of arsphenamine and twenty-one of mercuric salicylate. The Wassermann test made during the treatment continued to remain negative.

On Jan. 16, 1922, a spinal puncture was made. The fluid was under normal pressure. The colloidal gold curve was normal. The globulin test and the Wassermann test of the spinal fluid were negative.

From Jan. 16, 1922, to Oct. 10, 1931, the Wassermann test made at intervals of six and twelve months continued to be negative. There were no clinical symptoms of syphilis.

On Oct. 10, 1931, the patient presented a round lesion resembling a small gumma on the penis behind the corona. There was a history of exposure about six weeks previously. The lesion was positive for spirochetes. The Wassermann test made with cholesterolized antigen was 2 plus. The Kahn test was negative.

DISCUSSION

DR. I. ROSEN: There is no question in my mind that the patient has a primary lesion at this presentation. The main point is whether this patient has had three separate infections. The fact that he had not received even one full course of treatment following the first infection leads me to believe that we are not dealing with clearcut essentials.

DR. L. CHARGIN: There is evidence that the patient has been cured of the first infection. The development of a second lesion was sufficient evidence for me, because Neisser is of the opinion that a second infection cannot take place unless the first infection is cured. It is known that a person can be infected prior to the appearance of the secondary rash. But a patient can also be infected with secondary syphilis. A few years ago, Chesney, in his experimental work, showed that it was impossible for a person with syphilis to become immune and to be reinfected. If a reinfection occurs, then the old case of syphilis is probably cured. In this case, there were a positive test for spirochetes, a negative Wassermann reaction, a negative reaction of the spinal fluid and a period of a year during which there were no symptoms, the Wassermann test remaining negative during the first year. A lesion again appeared in a different location; again the test for spirochetes was positive and again treatment was given. Then there was a period in which the Wassermann test was repeatedly negative. Now the patient returns and again the test for spirochetes is positive. I think this is fairly good evidence that we are dealing with a third infection.

DR. H. SILVER: If one goes back to the first infection, one finds that the Wassermann test was negative in spite of the secondary papular eruption. This is important in that it throws light on this unusual case. It seems to me that we are not dealing with a reinfection but with an unusual ability of the patient to prevent the infection from becoming generalized.

DR. A. ROSTENBERG: There are many cases in which two men have contact with the same girl. One will become infected and the other will not. There must be an erosion for the spirochetes to enter. Even so, I think that it is possible that some people have resistance and do not become infected.

DR. L. CHARGIN: When the patient appeared in 1919 at our clinic the diagnosis was made on clinical grounds only, and the patient was treated immediately. Perhaps on this particular point there is inadequate evidence.

DR. I. M. LASHINSKY: The lesion that appeared in 1920 could hardly be considered a reinfection, as the patient had received only four injections of arsphenamine and eight injections of mercuric salicylate. But from July 7, 1920, until Jan. 16, 1922, in which period the patient received fourteen injections of arsphenamine and twenty-one injections of mercuric salicylate, and when not only the Wassermann test of the blood but that of the spinal fluid were negative, the patient should really be considered cured. Now, when nine years later the patient presents a penile lesion at a different location, we can consider this case (though it does not conform precisely to Bernard's criteria) one of reinfection.

ANGIOSARCOMA. Presented by DR. H. SILVER.

Mrs. O. S., aged 30, born in the United States, married, had been troubled since the age of 8 with hemorrhagic tumors. She had always been under the care of surgeons. At frequent intervals she had undergone operations, and had been operated on altogether fourteen times. A few years prior to presentation, hemorrhage and gangrene followed the removal of a larger tumor on the back of the right foot. Subsequently, the patient was under the care of an orthopedic surgeon for six months. She presented herself at the Bronx Hospital with an irrelevant condition of the skin, a dermatophytosis of the palm. On routine examination of the feet we discovered the following unusual condition: on the sole and dorsum of the right foot there were numerous hard, round, bluish nodules, ranging in size from that of a pea to that of a hazelnut. On the anterior surface of the entire right leg extending to the right side of the abdomen up to the region of the umbilicus there were walnut-sized and larger tumors; while some were covered with normal skin, others were distinctly hemorrhagic. All lesions were strictly confined to the right side of the body. Numerous scars and the deformity of the right foot were the result of the previous operations.

At one time a biopsy was made and angiosarcoma reported.

DISCUSSION

DR. S. FELDMAN: My understanding of an angiosarcoma is that it does not last many years. It probably is a semibenign angioma.

DR. C. WOLF: I feel that this is a case of angiofibrosarcoma which is nonmalignant and recurs locally on removal.

ONYCHOLYSIS. Presented by DR. H. B. FEILER.

H. L., a white man, aged 23, noticed while cleaning his nails that the distal end of the nail of the index finger of the right hand was more detached than the others. This separation of the nail continued, and in a short time the same process began to take place in the thumb and third finger of the same hand. Two months later all of the nails of both hands were similarly involved. The nails of both big toes were also affected, and the patient claimed that this began about one and a half years prior to presentation. The nail on the little toe of the right foot has separated completely. At the present time the nails are about half separated from the nail bed, but there is no sign of inflammation. The nail bed appears to be perfectly normal. Except for a gonococcal infection at the end of last year, the personal history is of little interest. The Wassermann test of the blood was negative. Nail scrapings were negative for fungi.

DISCUSSION

DR. I. ROSEN: I have seen similar conditions of the nails associated with psoriasis. Although there is no evidence of psoriasis at present in this patient, I believe that the condition is associated with psoriasis.

LYMPHOGRANULOMATOSIS INGUINALIS? Presented by DR. THEODORE ROSENTHAL.

M. H., a white man, aged 29, born in the United States, had had a gonorrheal infection in 1920 and 1925. On July 29, 1931, he appeared with a soft pea-sized ulceration on the shaft of the penis of three weeks' duration. The left inguinal glands were greatly enlarged and slightly painful. The dark-field examination for spirochetes was negative on two occasions. The Wassermann and Kahn tests made on July 29 and one month later were negative.

The penile ulcerations healed rapidly under treatment with saline applications, but the glands in the left groin became larger, and the skin over glands was reddened and tense. A culture made from material obtained by puncturing the glands was sterile, and auto-inoculation of the thigh gave negative results.

A week after admission, intramuscular injections of a nonspecific milk preparation were given every five days. Improvement was noted soon afterward, and after about four or five weeks of treatment the patient was much improved.

DISCUSSION

DR. A. ROSTENBERG: This young man came to the clinic about three months ago with a small ulcer on the penis, but its appearance was not suggestive of syphilis. He had no eruption on the body. He had rather large inguinal glands, especially on the left side. These glands increased greatly in size. The condition gave me the impression of a case of lymphogranulomatosis inguinalis. Local injection of the fluid from the gland gave a negative response, but this does not conform to the real Frei test. I believe that we are dealing here with a case of lymphogranulomatosis inguinalis which is getting better under treatment.

DR. L. CHARGIN: A diagnosis of gonorrheal adenitis should be considered.

DR. H. SILVER: To avoid confusion, I should suggest the name of Nicolas Favre's disease. The small ulceration of the penis and the large glands speak in favor of this disease. The Frei test should be done to establish the diagnosis.

NEW YORK DERMATOLOGICAL SOCIETY

E. R. MALONEY, M.D., *Secretary*

Regular Meeting, Oct. 27, 1931

J. FRANK FRASER, M.D., *President, in the Chair*

ERUPTION DUE TO PHENOLPHTHALEIN. Presented by DR. H. H. WHITEHOUSE for DR. JOHN E. LANE.

M. F., a married woman, aged 26, presented palm-sized, dark brown, sharply marginated areas on the upper part of the body, especially on the chest and breasts. She had been troubled with the eruption for nearly four years, the lesions constantly recurring. The condition began three weeks prior to presentation. The appearance of the lesions was preceded by prickling and burning. The patient was in the habit of taking phenolphthalein. An exacerbation could be produced with this drug.

DISCUSSION

DR. FRED WISE: I agree with the diagnosis of an eruption due to phenolphthalein. I have always considered the mottling within the larger lesions characteristic of an eruption due to this drug, though it also occurs in eruptions caused by antipyrine.

DR. HOWARD FOX: I cannot agree with Dr. Wise concerning the mottling, and I do not think that it is characteristic of eruptions due to phenolphthalein.

DR. E. F. TRAUB: There seems to be no doubt about the diagnosis. The patient has been given a therapeutic test, with a flare-up of the old lesions and the appearance of new ones. She also has two interesting lesions on the dorsum of the tongue.

DR. F. C. COMBES: I have never before seen white patches in the pigmented areas and have never considered them as characteristic of eruptions due to phenolphthalein. I do not recall having seen this type of eruption described in the literature.

A CASE FOR DIAGNOSIS (CUTIS MARMORATA?). Presented by DR. PAUL E. BECHET.

Mrs. B. M., aged 54, stated that the eruption had been present for approximately ten years and had undergone little or no change in that time. There were no subjective symptoms. The lesions were located on the outer side of the right arm; they were flat, pinkish red and slightly serpiginous, with noticeable telangiectasia. Their appearance resembled that of cutis marmorata. There was no atrophy, infiltration or tendency toward spontaneous disappearance. The lesions were entirely confined to the upper part of the right arm, and at times, the patient complained of a dull ache in this arm. Her medical attendant reported that her elimination was faulty, but that otherwise she was well.

DISCUSSION

DR. FRED WISE: The erythema seems to be due to faulty circulatory conditions analogous to erythrocyanosis cruris described by European dermatologists.

DR. H. H. WHITEHOUSE: The eruption does not seem to have anything to do with nevus. I do not know what it can be unless it is the condition suggested by Dr. Wise.

ANGIOLUPOID. Presented by DR. BINFORD THRONE.

Mrs. M. Z., a Russian Jewess, aged 55, first seen on Sept. 4, 1931, stated that a cutaneous condition had been present for eight months. On the right side of the nose there was a reddened oval plaque, the long diameter of which was in the direction of the external angle of the mouth. The lower border encroached slightly on the cheek. The long diameter was about three fourths of an inch (1.9 cm.), the short diameter about one-half inch (1.2 cm.). On the left side of the nose there was a similar plaque, which was round and about one-half inch in diameter. The lesions were bluish red; on diascopic pressure the red almost entirely disappeared, leaving a yellowish-brown tint. The surface was smooth and did not show atrophy or ulceration. Many fine telangiectatic vessels were visible in the upper layers of the plaques. On palpation the lesions were soft. There was no scaling or dilated follicular openings. Biopsy had been refused.

DISCUSSION

DR. P. E. BECHET: I sometimes find it impossible to differentiate lesions such as these on the nose. In this case it is difficult for me to eliminate lupus erythematosus, and I should consider that diagnosis as the better one.

DR. F. C. COMBES: Clinically, I should make a diagnosis of lupus erythematosus in this case. I have never observed a case of angiolupoid, and therefore I should like to hear Dr. Throne justify his diagnosis. The lesions in the case are well defined and erythematous; there are patulous follicles and a suggestion of atrophy. No scaling is present, but I understand that there has been some. I think that the use of injections of gold sodium thiosulphate rather than the application of radium would be justified in this case as a therapeutic test.

DR. E. F. TRAUB: My understanding of this condition is that it is bilateral and occurs in this location, but my impression is that scaling and atrophy, such as are usually found in lupus erythematosus, are not present. Furthermore, cases of this disease have rarely, if ever, been recorded in the United States. On the basis that the condition is probably lupus erythematosus, I believe that local intradermal treatments with a gold compound would be effective. Several treatments might clear up this condition.

DR. HOWARD FOX: I do not know how it is possible to differentiate this condition clinically from lupus erythematosus. The case illustrates the extreme difficulty in the diagnosis of lupus erythematosus, as was shown by Montgomery, who found that even from the histologic standpoint about twenty-six different conditions had to be considered in differentiation. At the time his paper was read, I had a survey made of the cases recorded (for about twenty years in the ARCHIVES and in the *Journal of Cutaneous Diseases)* in which a diagnosis of lupus erythematosus was considered. In addition to the list mentioned by Montgomery, about twenty additional diseases were mentioned that had been considered in the diagnosis.

DR. H. H. WHITEHOUSE: A diagnosis of sarcoid entered my mind when I saw the lesions, and though the symmetry and the location are unusual for that condition, I believe the case is one of sarcoid. A case of sarcoid has rarely been presented in which the possibility of its being lupus erythematosus has not been discussed.

DR. BINFORD THRONE: I think that the case corresponds almost identically to the description given in Lewandowsky's "Die Tuberculose der Haut." The lesions are symmetrical; they are round or oval and situated on the side of the nose; no scaling was present prior to the application of radium, and there is no atrophy or ulceration.

So far as the name of the condition is concerned, I think that it is justifiable to use the name under which a condition was first described, unless further study and observation definitely places it in a specific class. In the latest edition of Hoffman's "Behandlung der Haut und Geschlechtskrankheiten" the name is used. He stated that the condition is probably a variety of Boeck's sarcoid, which it resembles histologically.

So far as therapy with a gold compound is concerned, several years ago I presented a patient with this condition in whom there had been complete failure with that line of treatment.

A CASE FOR DIAGNOSIS (AMYLOID DEGENERATION?). Presented by DR. BINFORD THRONE.

Bertha R., aged 54, was admitted to the outpatient department of the New York Skin and Cancer Hospital on Aug. 31, 1928, for treatment of a cutaneous condition which she stated had begun about thirty-seven years previously. The onset was marked by pruritus; after a short time the eruption appeared, and it had remained for the last ten years. About thirteen years prior to presentation the patient was operated on for a "tumor" of the uterus and "gallstones." This operation was performed in Jersey City, N. J. In 1924, the thyroid and a fatty tumor on the shoulder were removed at the Mayo Clinic. Previous to the onset of the pruritus the patient had suffered from gastritis. In addition, she had had the ordinary diseases of childhood. One sister had died of carcinoma mammae; another sister had been operated on for "tumors" of the breast and was still living. There had been no change in the patient's skin since her first visit in 1928.

Examination showed large plaques of light brown follicular papules on the trunk and limbs, intermingled with many scratch marks; slight inflammatory signs were present in the scratched regions, but redness was practically never seen in or immediately around the papules. The papules were rounded or flat, and at times their borders were angular; they were most marked on the outer sides of the forearms, the lower part of the abdomen, the shoulders, the lumbar

region and around the ankles. The face was free from lesions, as were also the hands, feet and scalp. The papules were soft and smooth. Scaling had never been seen.

On the patient's admission to the hospital a section of tissue taken for biopsy showed an epidermis with well developed rete pegs and also a horny layer composed of several layers which were separated, giving a vacuolized effect. In certain areas there was a slight perivascular edema about thickened vessels in the upper part of the corium. There were only slight irregularities in the outline of the prickle cells, with the exception of one corner of some sections where the cells were swollen.

Another biopsy was performed on Oct. 21, 1931. Three papules were removed, one from the right shoulder, one from the lower part of the back and one from the left shoulder. The section from the back showed an epidermis with well marked rete pegs and a rather heavy nonparakeratotic scale. The granular layer was irregular, and near the follicle openings it was increased in thickness. There was very little change in the epidermis. The prickle cells had large round nuclei. A few round cells were scattered throughout the epidermis. The blood vessels were surrounded by cellular exudate consisting of lymphocytes and connective tissue cells and also a few cells containing brown pigment.

A section from the left shoulder showed a greater differentiation in the size and shape of the prickle cells, especially at the follicle openings, where the granular layer was thickest. The prickle cells were swollen and somewhat irregular in size. There was swelling in the cytoplasm as well as in the nuclei. Some of the nuclei appeared irregular, almost semilunar. There were horny plugs in the hair follicles. There was also a dense inflammatory reaction in the upper corium.

A section from the right shoulder showed similar changes, with an even thicker corneum.

A dextrose tolerance test was made on Oct. 5, 1931, and gave the following results:

Time	Chlorides, Mg.	Sugar, Mg.	Urea Nitrogen, Mg.	Uric Acid, Mg.
Before	479.3	101.8	16.2	3.83
After ½ hour	475.1	183.4	16.4	3.12
After 1 hour	483.5	219.6	16.5	3.23
After 1½ hours	466.8	197.2	16.4	2.76
After 2 hours	479.3	123.2	16.9	2.5
After 3 hours	482.6	126.0	18.3	2.78
After 4 hours	487.6	101.8	16.3	2.64

The average of the first four observations on the blood sugar after the administration of the dextrose was 180.2 mg. On account of this condition, small doses of insulin were administered. The basal metabolic rate on October 19, was —6.35 per cent. The Wassermann reaction of the blood was negative.

The patient had received various kinds of treatment, but none had been of any value. The condition when the patient was presented was practically the same as when she was first seen in 1928.

The following diagnostic possibilities were considered and eliminated by the histologic observations: urticaria perstans, prurigo nodularis, Darier's disease and the different forms of lichen. The lack of vesicles of course ruled out Duhring's disease. Epidermodysplasia verruciformis of Lewandowsky and Lutz had to be seriously considered on account of the changes in the rete cells, but the changes in the derma and the marked pruritus seemed to eliminate that condition.

DISCUSSION

DR. F. C. COMBES: This is an interesting case. The patient has a pruritus of many years' duration, associated with a lichen-like eruption, particularly on the lower extremities. Some years ago she underwent an operation on the gallbladder.

That is not without significance. Radcliffe-Crocker was of the opinion that in more than 90 per cent of patients with essential pruritus there was some disturbance in hepatic function.

Many general surgeons even now are of the opinion that the production of many dermatoses is dependent on the liver. Dr. John Erdman has expressed this opinion in reference to psoriasis. I think that in this case the pruritus was primary and the lichenification secondary; it falls into the group of neurodermatoses as lichen chronicus diffusus.

DR. HOWARD FOX: I should call this case an extensive lichenification of a peculiar type. Some of the lesions on the leg suggest what has been called lichen obtusus. Apropos of the relationship of hepatic disturbance to cutaneous disease, I recall the case I showed before this society in which extensive lichenification of several years' duration disappeared suddenly following the removal of the gallbladder. I should not consider the diagnosis of Darier's disease, which was mentioned in informal discussion, as the papules were not keratotic, and the eruption was very itchy.

DR. FRED WISE: It might be necessary to use special stains to demonstrate amyloid, and I suggest that additional histologic studies be made.

DR. H. H. WHITEHOUSE: I agree that the case is pruritus with lichenification. What relation can the condition have to lichen planus if in the other case mentioned it disappeared entirely on the removal of the gallbladder? I have had several cases in which frank lichen planus cleared up entirely following removal of the gallbladder.

DR. P. E. BECHET: I think that the lesions are primary, not secondary. They are distinctly nodular on the leg, greatly resembling those of lichen obtusus, as Dr. Fox suggests. I do not believe that scratching is entirely responsible for their production.

DR. BINFORD THRONE: I have been trying to find out something about the liver problem for many years, and I have not learned anything definite. In this case the gallbladder was operated on thirteen years ago; the cutaneous condition began twenty-four years previous to that operation. The patient has shown an abnormal tolerance for dextrose; the amount of sugar in the blood should not exceed 160 mg. per hundred cubic centimeters. I cannot see any connection between the operation on the gallbladder and the onset of the condition. I asked Dr. Barthel whether she could observe anything that resembled lichen or lichenification, and she replied that the appearance of the section would rule out such a condition. There were well marked changes in the epidermis, and only a moderate infiltration in the upper part of the corium. Dr. Wise's suggestion of amyloid degeneration is interesting, and I will have it followed up.

CHEILITIS EXFOLIATIVA. Presented by DR. HOWARD FOX.

A. Z., a girl, aged 17, was recently discharged from a sanatorium for pulmonary tuberculosis. For the past eighteen months she had suffered from constant exfoliation of the lips, chiefly affecting the upper lip at the junction of the mucous surface and the vermilion border. She had been treated by fractional doses of unfiltered roentgen rays, a total of 2½ skin units having been given during a period of two months. Several ultraviolet ray treatments had been given at another time and a trial of various drugs, including sulphur, resorcin and silver nitrate, had been made. She had also received general tonics. No benefit had resulted from any of these methods of treatment, and the case was submitted for therapeutic suggestions.

DISCUSSION

DR. F. C. COMBES: The patient should be tested for sensitivity to the mouth wash or tooth paste that she uses.

DR. HOWARD FOX: In cases of eruption around the mouth, I have usually made inquiry regarding the use of mouth washes and dentifrices. I am glad to have Dr. Combe's suggestion of making therapeutic tests.

EXTENSIVE MELANOMA. Presented by DR. HOWARD FOX.

Mrs. M. deH., aged 50, a trained nurse, born in Hungary, since birth had presented a lesion occupying the greater part of the left side of the forehead. It was about 3½ inches (8.8 cm.) in the longest dimension, and extended slightly to the scalp. It was well defined and consisted of smooth, rounded nodules; some were discrete and others coalesced to form lumpy masses. The eruption was slaty blue and did not disappear on pressure.

Five months prior to presentation she had fallen on her face, and two weeks later there was considerable swelling and tenderness of the lower part of the lesion, which had gradually lessened somewhat. At that time she had suffered from phlebitis of the thigh. There were no lesions elsewhere to suggest metastasis. She had not been treated.

DISCUSSION

DR. J. F. FRASER: In my opinion, the lesion should be let alone.

EXFOLIATIVE DERMATITIS. Presented by DR. P. E. BECHET.

L. G., a woman, aged 29, had had a severe case of psoriasis for many years which, although a chrysarobin dermatitis was not present, changed into a generalized scarlet, lobster-red, peeling dermatitis that involved the entire area of the skin. When the patient was first seen, this generalized exfoliation had been present without remission for eight years. A blood count showed: hemoglobin, 70; red cells, 3,770,000; white cells, 10,600; polymorphonuclears, 64 per cent; lymphocytes, 33 per cent, and eosinophils, 3 per cent.

DISCUSSION

DR. E. F. TRAUB: This seems to be a typical case of exfoliative dermatitis, and apparently psoriasis has been definitely established as the eruption preceding the onset of the present condition. The only question is whether the therapy with arsenic had any bearing on bringing about the exfoliation. I have no therapeutic suggestions other than those that Dr. Bechet has already tried, and which I believe should still be carried on for some time.

DR. BINFORD THRONE: I do not think that sodium thiosulphate has been given a sufficient trial. I should give 1 Gm. intravenously every day or as often as possible; on the days when it is not given, enteric coated tablets should be given, the daily dose by mouth being from 1.5 to 2 Gm. I have found the addition of parathyroid valuable at times, and it could be given in one-tenth grain (0.00648 Gm.) doses three times a day. The thiosulphate should be continued until an alkalosis develops, and then it should temporarily be discontinued and a calcium preparation, preferably calcium chloride urea, substituted. The combination of the parathyroid and the calcium will increase the blood calcium. This can be watched by making determinations of blood calcium and phosphorus, and when the amount of calcium exceeds the normal, the use of parathyroid can be discontinued.

DR. P. E. BECHET: I am grateful for Dr. Throne's suggestions; the patient has received sodium thiosulphate for two months, without benefit. A test for arsenicals did not show any retention of that metal. However, I shall use sodium thiosulphate again as he suggests.

ONYCHOGRYPHOSIS (CONGENITAL). Presented by DR. P. E. BECHET.

Since birth Mrs. S. H. had had extensive hypertrophy of all the nails. One of the children was similarly affected. All therapeutic measures had proved unavailing.

DISCUSSION

DR. F. C. COMBES: I have nothing to add, except that the proper term for this condition of the nails should be onychoposis instead of onychogryphosis. The root term is from the Greek, grypos, meaning curved.

DR. HOWARD FOX: This case is of especial interest to me, as I saw the patient nineteen years ago at the Polyclinic Hospital when she was 5 years of age. At that time she presented a classic picture of onychogryphosis affecting all the finger-nails and toe-nails. The toe-nails, which showed a well marked example of the typical ram's horn twist, were removed and attached to a wax cast which was made at the time. At present the condition is one of markedly thickened nails, without the twisting. The case is furthermore interesting as she now has a slight leukokeratosis of the tongue and keratosis of the soles. These changes correspond to the ones described in the "Ikonographia" by Jadassohn and Lewandowsky as pachonychia congenita, a case of which I have also presented before this society.

LUPUS MILIARIS IN A SYPHILITIC PATIENT. Presented by DR. E. R. MALONEY.

H. McG., a white woman, 29 years old, had been under treatment for secondary syphilis since April, 1931. While she was undergoing treatment with arsenic and mercury, in June, 1931, an eruption developed, made up of small, flat papules, ranging in size from that of a pinhead to that of a split pea. Some of these papules were the color of the skin; some were yellowish and some reddish. The eruption occurred mostly on the neck, shoulders and chest; a few lesions had recently developed on the chin.

The Wassermann test made in April was strongly positive, and in June it was negative.

Microscopic examination of a removed papule showed miliary tubercles containing epithelioid and giant cells. Inoculation into a guinea-pig at the end of seven weeks gave negative results. (This test was made again.) The Mantoux test was negative.

GENERALIZED PAPULAR AND VEGETATING ERUPTION DISAPPEARING AFTER THE DRINKING OF SULPHUR WATER. Presented by DR. HOWARD FOX.

A. H., aged 35, a claims agent, had previously been presented before the Manhattan Dermatological Society on May 12, 1931. Despite considerable clinical and laboratory study, no definite diagnosis had been made, and practically no relief had been afforded by treatment. He recently returned to the clinic, and was hardly recognized on account of the disappearance of the eruption. He had also gained 10 pounds (4,500 Gm.). He had spent two months in Cobbleskill, doing no work and living on good food, including a good deal of milk. He also drank large amounts of a local natural spring water said to contain sulphur. At the end of the first two weeks improvement began, and at the end of two more weeks the eruption had almost disappeared.

He had previously been at the same place in the country for a month, at which time he had tried to build up his health by good food and copious drinking of milk, but he had not taken the sulphur water.

A photograph of the patient demonstrating his former condition, with marked vegetations on the face, was submitted, and showed the striking change in his appearance.

DISCUSSION

DR. F. C. COMBES: I should like to know what the eosinophil count was in this case.

DR. BINFORD THRONE: I think that in this case a great part of the result should be attributed to the action of the sulphur water. The discovery by Hopkins of England of glutathione in the cytoplasm of the cell and cell nucleus, and of its importance in the oxygen reduction processes in the cell is of great value. Glutathione contains a sulph-hydril radical. Any condition that interferes with it would cause improper functioning of the cells. It was on this principle that Dr. Myers considered the action of sodium thiosulphate to be based. In this case the

sulphur water has probably supplied the necessary radicals and thus restored the cell so that it can perform its normal metabolic functions. The change of environment and rest, of course, has helped.

DR. E. F. TRAUB: I saw this patient a number of times in Dr. Fox's clinic. As shown in the photographs, the condition was unusual and extensive, and apparently it was becoming progressively worse, even under treatment. The change is certainly striking, and no doubt must be attributed to the sulphur water.

DR. HOWARD FOX: The disappearance of the eruption has been truly remarkable, though of course there is no proof that it was due to the drinking of water containing sulphur. I have always been very skeptical about the value of sulphur in cutaneous diseases when administered internally, but I think that the results in this case are suggestive.

"LYMPH SCROTUM." Presented by DR. H. J. SCHWARTZ.

O. M., a man, aged 49, was born in Italy but had lived in the United States (New York and New Jersey) for thirty-two years. He had never lived in the tropics. For the past twelve years he had suffered from attacks of chills and fever recurring at irregular intervals and lasting for three or four days. These attacks were accompanied by redness, swelling and tenderness of the penis and scrotum. This swelling was at first transient and subsided entirely between attacks, but in recent years it had become permanent. At the time of presentation, the scrotum and penis showed marked edematous swelling with numerous lymphatic varices scattered over the surface.

The case was submitted as one of elephantiasis of the penis and scrotum, or "lymph scrotum," of unknown etiology, as there had been no opportunity to study it during a febrile attack.

DISCUSSION

DR. HOWARD FOX: While it may be true that the patient has always lived near New York during his residence in this country, he originally came from Italy. On account of the presence of recurring febrile attacks in association with the "lymph scrotum," I think that he is probably suffering from filariasis, which at the outset may have been latent for a long period.

DR. R. H. RULISON: The patient probably has filariasis.

DR. BINFORD THRONE: I agree with Dr. Rulison.

DR. H. J. SCHWARTZ: I stated that the patient was born in Italy and has been in this country for thirty-two years. The first signs of the condition appeared twelve years ago. I presented the case as one of "lymph scrotum" of unknown etiology, for we have not had the opportunity to study the patient during an attack. I saw him while he was under treatment for another condition. I have asked him to get in touch with me when he has another febrile attack when an examination for filariasis will be made. Filarial infection, however, is not the only etiologic factor in these cases. Any chronic or recurring inflammatory process, such as repeated attacks of erysipelas, may ultimately result in hypertrophy and thickening of the affected part.

LEUKODERMA AND CHLOASMA. Presented by DR. PAUL E. BECHET.

F. R., a man, aged 22, stated that the eruption first appeared on the face sixteen years previously. The entire face was involved by depigmented areas, with hyperpigmentation over both malar regions and the nose, strongly resembling chloasma. There were areas of vitiligo on the arms.

DISCUSSION

DR. HOWARD FOX: While at the Harlem Hospital a number of years ago, I saw a colored man who had turned completely white from vitiligo, except for a patch about the size of a dollar.

LEUKONYCHIA STRIATA. Presented by DR. FRED WISE.

J. N., a man, aged 42, born in Russia, a patient at the Post-Graduate Skin Clinic, had a condition of the nails of two years' duration. In his occupation, the man handled preparations of saltpeter, vegetables, spices etc. There were no changes in the skin of the fingers. The toe-nails were not affected.

All of the finger-nails were chalk white and lusterless. The surface of the nails was smooth, and there were no signs of subungual keratosis or thickening of the nails themselves. Most of the nails of the hands presented broad striations, while two of the nails on each hand were uniformly chalk white, with no evidence of a normal nail structure. In most of the other nails the involvement represented more than two thirds of the nail, leaving only narrow bands of apparently normal nail between the chalk white bands.

The patient's general health was good, and there were no subjective symptoms.

A CASE FOR DIAGNOSIS. Presented by DR. E. F. TRAUB.

I. M., a salesman, aged 36, born in Russia, was presented before the society in December, 1930, the tentative diagnosis of his condition being tertiary syphilis. At that time, he presented a single, large, ulcerating lesion over the hard palate which had failed to disappear or to respond to any treatment in more than a year. This lesion had been excised by surgical diathermy. Perfect healing had resulted, so that the scar was hardly visible when the patient was again presented.

About this scar, new, tiny, superficial ulcerations had appeared, and there was a peculiar eruption on the cutaneous surface of the upper lip. These lesions were indefinite, and apparently were either crusted papules or papulovesicular lesions. No cleancut vesicle was noted. The entire duration of the condition of the mouth was about two and a half years.

At the time of the earlier presentation, Dr. Wise suggested Vincent's infection, and the organism was found on removal of the tonsils. Dr. Fox had examined a smear for Donovan bodies, with a negative result.

DISCUSSION

DR. BINFORD THRONE: I think that the possibility of beginning pemphigus should be given consideration.

DR. FRED WISE: I saw the patient at the previous presentation. I believe that the lesions of the mouth are probably caused by Vincent's disease, and that the lesions on the face are of an acneform character.

DR. HOWARD FOX: I agree with Dr. Wise. Pemphigus is unlikely to have been confined to the mouth for such a long period without an accompanying loss of weight.

DR. H. H. WHITEHOUSE: I am inclined to favor Dr. Wise's interpretation of the case, namely, that the lesions on the lip have nothing to do with the condition in the mouth.

DR. F. C. COMBES: I agree with Dr. Wise.

DR. P. E. BECHET: I also should exclude the diagnosis of pemphigus, but I should like to take exception to the remark of Dr. Fox that loss of weight and debility almost invariably accompany an attack of pemphigus. While this holds true in the end-stages of the condition, it is not true throughout the course. I have frequently seen pemphigus occur without affecting the patient's health until near the end. I have had under personal observation two cases of pemphigus in which the lesions were confined to the mouth for two years without affecting either the weight or the health of the patients, yet both died a few months after the eruption had become generalized.

DR. R. H. RULISON: I agree with Dr. Wise. In this case the lesion on the anterior pillar of the right tonsil is typical of Vincent's angina.

DR. W. J. HIGHMAN: Is the lesion on the face of the same duration as that in the mouth? I have never seen one small patch of sycosis or acne remain for two and a half years without extension. What is the history of the patient as to general health?

DR. E. F. TRAUB: The patient has been studied particularly from the standpoint of tuberculosis and syphilis. Wassermann tests have repeatedly given negative results, even following therapeutic tests. Three biopsies revealed nothing but chronic inflammatory tissue. Physical examination, as well as roentgen examination of the chest, gave negative results for tuberculosis. A smear from the tonsils when they were removed was positive for Vincent's infection.

DR. W. J. HIGHMAN: To me, the most plausible explanation of the case, subject to further study, would be that the lesions on the mouth and the face are related. For that reason, I doubt whether the condition is Vincent's stomatitis. I do not think that the patient has pemphigus. Though I agree with Dr. Wise in general, I do not see why the lesions of pemphigus cannot occur on the hard palate, and I do not think that the duration rules out pemphigus. I think that whatever the infectious agent is, it has caused both the lesions of the mouth and those of the face. I believe that the condition is tuberculosis. The lesion on the face and not the buccal lesion should be studied histologically. If the condition is shown not to be tuberculosis, at least the case will have been removed from the realm of conjecture. The test with tuberculin should be made to study the local rather than the general reaction.

DR. BINFORD THRONE: I should take exception to the statement that pemphigus cannot exist without inanition. Only recently we had a case at the Skin and Cancer Hospital in which no appreciable loss of weight and strength occurred for many months; only when the condition became generalized did such loss occur, but at that time it was extremely rapid. In another case, the patient was in the hospital for many months with a peculiar granulomatous condition in the groins. The condition then became generalized, and was a typical case of pemphigus vegetans. Inanition appeared only after generalization of the process, and the patient died in a short time.

DR. E. F. TRAUB: I appreciate the helpful suggestions made. The reason why I brought up the question of pemphigus was because this disease frequently begins in the mouth, and it remains there for a long time in an incipient and atypical stage before characteristic cutaneous manifestations develop. In this case the lesions on the upper lip might well be those of pemphigus. This condition came to my mind only because of the persistence of the condition in spite of active treatment. Inanition is not necessarily an early feature in pemphigus, as I had a patient who had lesions confined to the mucous membranes for five years, and only with the onset of the cutaneons lesions did an appreciable loss of weight ensue. In this case, the lesions were first noticed on the penis; then they appeared in the mouth, throat, gastro-intestinal tract and lids of both eyes; the case was exceptional in that blindness resulted after the disease had progressed for about two years.

Directory of Dermatologic Societies *

NATIONAL DERMATOLOGIC SOCIETIES

American Medical Association, Scientific Assembly, Section on Dermatology and Syphilology

George Miller MacKee, Chairman, 200 W. 59th St., New York.
Francis E. Senear, Secretary, 55 E. Washington St., Chicago.
Place: New Orleans. Time: May 9-13, 1932.

American Dermatological Association

W. H. Mook, President, 3720 Washington Blvd., St. Louis.
W. H. Guy, Secretary, 7026 Jenkins Arcade, Pittsburgh.
Place: Havana, Cuba. Time: May 3-5, 1932.

British Association of Dermatology and Syphilology (Canadian Branch)

Philip Burnett, President, 2 Simpson St., Montreal.
L. P. Ereaux, Secretary, 1380 Sherbrooke West, Montreal.
Place: Toronto. Time: 1932.

SECTIONAL DERMATOLOGIC SOCIETIES

Baltimore-Washington Dermatological Society

Lee McCarthy, President, 1835 Eye St. N. W., Washington, D. C.
M. H. Goodman, Secretary, 401 Medical Arts Bldg., Baltimore.

Central States Dermatological Association

Howard J. Parkhurst, President, 316 Michigan St., Toledo, Ohio.
Robert E. Barney, Secretary, 1021 Prospect Ave., Cleveland.
Place: Pittsburgh. Time: October, 1932.

Iowa and Western Illinois Dermatological Association

J. C. Kessler, President, University Hospital, Iowa City.
J. W. Bailey, Secretary, 10th St., and Grand Ave., Des Moines, Iowa.

New England Dermatological Society

Arthur M. Greenwood, President, 416 Marlboro St., Boston.
William P. Boardman, Secretary, 388 Marlboro St., Boston.
Place: Boston. Time: April 13, 1932.

Southern Medical Association, Section on Dermatology

Emmet R. Hall, Chairman, 1001 Exchange Bldg., Memphis, Tenn.
Dudley C. Smith, Secretary, University, Va.

STATE DERMATOLOGIC SOCIETIES

Louisiana Dermatological Society

R. A. Oriol, President, 921 Canal St., New Orleans.
M. T. Van Studdiford, Secretary-Treasurer, 150 Baronne St., New Orleans.

* Secretaries of dermatologic societies are requested to furnish the information necessary for the editor to make this list complete and to keep it up to date.

MEDICAL SOCIETY OF THE STATE OF NEW YORK, SECTION ON DERMATOLOGY AND SYPHILOLOGY

Edward R. Maloney, Chairman, 853 7th Ave., New York.
George C. Andrews, Secretary, 115 E. 61st St., New York.

MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA SECTION ON DERMATOLOGY

Edward F. Corson, President, Medical Arts Bldg., Philadelphia.
Stanley Crawford, Secretary, 200, 9th St., Pittsburgh.

MICHIGAN STATE MEDICAL SOCIETY, SECTION ON DERMATOLOGY AND SYPHILOLOGY

Cyril K. Valade, Chairman, 1604 Eaton Tower, Detroit.
George H. Belote, Secretary, University Hospital, Ann Arbor.

MINNESOTA DERMATOLOGICAL SOCIETY

H. N. Klein, President, 350 St. Peter St., St. Paul.
D. D. Turnacliff, Secretary, 407 Medical Arts Bldg., Minneapolis.

OKLAHOMA DERMATOLOGICAL ASSOCIATION

C. J. Woods, President, 108 W. 6th St., Tulsa.
C. L. Brundage, Secretary, 616 Medical Arts Bldg., Oklahoma City.

LOCAL DERMATOLOGIC SOCIETIES

ATLANTA DERMATOLOGICAL SOCIETY

Francis G. Jones, President, 384 Peachtree St., Atlanta, Ga.
Charles A. Wilkins, Secretary, Medical Arts Bldg., Atlanta, Ga.

BRONX DERMATOLOGICAL SOCIETY

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Index to Current Literature

DERMATOLOGY

Allergic Skin Reaction. H. L. Alexander, Arch. Dermat. & Syph. **24**:543 (Oct.) 1931.

A Neglected Boil. G. E. Blue, J. M. A. Alabama **1**:53 (Aug.) 1931.

Autohemic Treatment of Rhus Toxicodendron Dermatitis. E. Grimes, Arch. Dermat. & Syph. **24**:725 (Nov.) 1931; abstr., J. A. M. A. **98**:172 (Jan. 9) 1932.

Biotropism (Milian). J. H. Sequeira, Brit. J. Dermat. **43**:553 (Nov.) 1931.

Black Tongue: Case Reports. T. G. Mitchell, Northwest Med. **30**:464 (Oct.) 1931.

Chemical Nature of Pellagra Toxin and Thiosulphate Treatment of Pellagra. I. Sabry, Lancet **2**:1020 (Nov. 7) 1931.

Cistern Puncture. L. Jacobi, Am. J. Syph. **15**:544 (Oct.) 1931; abstr., J. A. M. A. **98**:170 (Jan. 9) 1932.

Clinical and Experimental Observations in Lymphogranuloma Inguinale. A. Buschke, A. Boas and von Vàsàrhelyi, Med. Klin. **27**:1562 (Oct. 23) 1931; abstr., J. A. M. A. **98**:181 (Jan. 9) 1932.

Dermal Edema in Carcinoma of Breast: Case. E. A. Votta, Prensa méd. argent. **18**:662 (Oct. 20) 1931.

Dermatitis Venenata Due to Shoe Leather: Two Cases. G. M. Lewis, Arch. Dermat. & Syph. **24**:597 (Oct.) 1931.

Dermatology in Soviet Russia. H. Fox, Arch. Dermat. & Syph. **24**:853 (Nov.) 1931.

Diagnosis and Treatment of Common Dermatoses. R. P. Lester, J. M. A. Alabama **1**:104 (Sept.) 1931.

Early Epithelioma. L. Savatard, Arch. Dermat. & Syph. **24**:835 (Nov.) 1931.

Eczema Due to Fungi: Report of Case in an Eighteen Months' Old Baby. S. M. Peck and G. Salomon, Arch. Dermat. & Syph. **24**:554 (Oct.) 1931.

Estimation of Capillaroscopy on Skin Surrounding Nail. F. Jamin, München. med. Wchnschr. **78**:1853 (Oct. 30) 1931.

Etiology and Therapy of Nitritoid Crisis and of Arsphenamine Dermatitis. W. Milbrandt, München. med. Wchnschr. **78**:1860 (Oct. 30) 1931; abstr., J. A. M. A. **98**:181 (Jan.) 1932.

Fatal Ioderma. J. J. Eller and E. C. Fox, Arch. Dermat. & Syph. **24**:745 (Nov.) 1931; abstr., J. A. M. A. **98**:172 (Jan. 9) 1932.

Few Remarks About Treatment of Rhinophyma. A. Marin, Canad. M. A. J. **25**:589 (Nov.) 1931.

Fox-Fordyce Disease. S. Neumark, Polska gaz. lek. **10**:848 (Nov. 1) 1931.

Generalized Actinomycosis (Pyemic Form): Case. P. F. Shapiro, Arch. Path. **12**:397 (Sept.) 1931; abstr., J. A. M. A. **97**:1987 (Dec. 26) 1931.

Kerion Microsporicum with Hematogenous and Ectogenous Microsporids: Case, with Reference to Literature. A. Blumenfeld, Arch. Dermat. & Syph. **24**:607 (Oct.) 1931.

Late Observations on Etiology and Treatment of Pityriasis Rosea. H. H. Hazen, South. M. J. **24**:937 (Nov.) 1931.

Leukemia Cutis: Case. F. R. Schmidt, Arch. Dermat. & Syph. **24**:587 (Oct.) 1931.

Lupus Erythematosus Disseminatus. W. H. Mook, R. S. Weiss and L. K. Bromberg, Arch. Dermat. & Syph. **24**:786 (Nov.) 1931.

Lupus Erythematosus Disseminatus Acutus in Juvenile. C. C. Stewart and W. H. Goeckerman, Am. J. Dis. Child. **42**:864 (Oct.) 1931.

Macular Atrophy of Skin. L. Chargin and H. Silver, Arch. Dermat. & Syph. **24**:614 (Oct.) 1931.

Miliary Tuberculosis with Purpura in Infancy. M. S. Gaede and J. O. Vaughn, Am. J. Dis. Child. **42**:869 (Oct.) 1931.

Multiple Lesions of Skin Apparently of Epithelial Origin Resembling Clinically Mycosis Fungoides: Case. L. W. Ketron and M. H. Goodman, Arch. Dermat. & Syph. **24**:759 (Nov.) 1931.

Nature of Hodgkin's Disease. W. L. A. Wellbrock and H. B. Loughery, Am. J. Clin. Path. **1**:455 (Nov.) 1931.

Occurrence of Spirochaeta Pallida in Inguinal Lymph Nodes of Persons with Dementia Paralytica. W. Worms and F. O. Schulze, Deutsche med. Wchnschr. **57**:1856 (Oct. 30) 1931.

Onychia as Occupational Disease. H. Haldin-Davis, Brit. M. J. **2**:845 (Nov. 7) 1931.

Pellagra: Etiology and Pathogenesis. J. M. Tomé y Bona, Siglo méd. **88**:381 (Oct. 17) 1931.

Pellagra-Preventive Value of Canned Spinach, Canned Turnip Greens, Mature Onions and Canned Green Beans. G. A. Wheeler, Pub. Health. Rep. **46**:2663 (Nov. 6) 1931; abstr., J. A. M. A. **97**:1988 (Dec. 26) 1931.

Possibilities of Bismuth Therapy in Treatment of Cutaneous Diseases. M. B. MacKenna, Brit. J. Dermat. **43**:565 (Nov.) 1931.

Presence of Uneven Quantities of Bismuth in Oily Bulk Suspension of Bismuth Salts. H. N. Cole, Katharine L. Henderson, W. F. von Oettingen and T. Sollmann, Arch. Dermat. & Syph. **24**:739 (Nov.) 1931; abstr., J. A. M. A. **98**:172 (Jan. 9) 1932.

Proliferative Gingivitis of Pregnancy: Cases. S. Monash, Arch. Dermat. & Syph. **24**:580 (Oct.) 1931; abstr., J. A. M. A. **97**:1922 (Dec. 19) 1931.

Psychosis with Pellagra. U. G. Iles, M. Bull. Vet. Adm. **7**:937 (Oct.) 1931.

Radiotherapy. O. T. Cruikshank, Physical Therap. **49**:411 (Nov.) 1931.

Relationship of Dermatitis Exfoliativa Neonatorum Ritter and Impetigo Bullosa in Adult. S. J. Zakon, Arch. Dermat. & Syph. **24**:830 (Nov.) 1931.

Schizosaccharomycosis: I. Present Status of Identification of Schizosaccharomyces Hominis and Its Results. T. Benedek, Arch. Dermat. & Syph. **24**:557 (Oct.) 1931.

Sensitizations: Regional, Seasonal, Dietary and Other, Influences Accounting for Variations and Fluctuations. M. B. Sulzberger and R. L. Mayer, Arch. Dermat. & Syph. **24**:537 (Oct.) 1931.

Serologic Results in Malarially Treated General Paralysis. J. E. Nicole and E. J. Fitzgerald, Am. J. Syph. **15**:496 (Oct.) 1931; abstr., J. A. M. A. **98**:170 (Jan. 9) 1932.

Skin Temperatures of Children. F. B. Talbot, Velma Bates, Eleanor Bates and Alice J. Dalrymple, Am. J. Dis. Child. **42**:965 (Oct.) 1931; abstr., J. A. M. A. **97**:1920 (Dec. 19) 1931.

Sporotrichosis in Connecticut: Case. E. C. Weise, New England J. Med. **205**:951 (Nov. 12) 1931.

Therapeutic Use of Bacteriophage and Its Practical Difficulties. F. B. Lynch, Jr., Am. J. Clin. Path. **1**:449 (Nov.) 1931; abstr., J. A. M. A. **98**:77 (Jan. 2) 1932.

Treatment of Epitheliomas by Physical Methods. A. F. Tyler, Nebraska M. J. **16**:417 (Nov.) 1931.

Treatment of Recurrent Erysipelas. H. L. Amoss, Ann. Int. Med. **5**:500 (Oct.) 1931.

Tuberculide en Plaque. S. E. Sweitzer, Arch. Dermat. & Syph. **24**:842 (Nov.) 1931.

Vaccinia Through Contagion: Case. S. Vanni, Clin. pediat. **13**:833 (Oct.) 1931.

Xanthoma Diabeticorum: Case. H. J. Templeton and E. E. Chouret, Arch. Dermat. & Syph. **24**:604 (Oct.) 1931.

Xanthomatosis. H. B. Mettel, Am. J. Dis. Child. **42**:858 (Oct.) 1931.

SYPHILOLOGY

Bacterial Protein Fever in Treatment of Syphilis in Rabbit. J. A. Kolmer, Arch. Dermat. & Syph. **24**:546 (Oct.) 1931; abstr., J. A. M. A. **97**:1922 (Dec. 19) 1931.

Comparative Study of Cardiovascular Syphilis in White and Colored Races. T. Z. Cason, Am. J. Syph. **15**:527 (Oct.) 1931.

Comparison of Results of d'Amato Test for Syphilis and Results of Wassermann Test. G. di Geronimo, Riforma med. **47**:1554 (Oct. 12) 1931; abstr., J. A. M. A. **98**:87 (Jan. 2) 1932.

Diagnosis and Treatment of Latent Syphilis. C. B. Willmott, Kentucky M. J. **29**:596 (Nov.) 1931.

Hydrotherapy in Syphilis. L. Thompson, Am. J. Phys. Therapy **8**:216 (Nov.) 1931.

Jugular Compression: An Adjunct in Treatment of Syphilis of Central Nervous System. D. C. Smith and J. A. Waddell, Arch. Dermat. & Syph. **24**:727 (Nov.) 1931; abstr., J. A. M. A. **98**:172 (Jan. 9) 1932.

New Method of Inoculation to Prove Infectivity of Semen in Latent Syphilis. G. Kertséz, Brit. J. Dermat. **43**:588 (Nov.) 1931.

Relationship of Serology of Blood to That of Spinal Fluid in Congenital Syphilis. F. W. Cregor, Arch. Dermat. & Syph. **24**:733 (Nov.) 1931; abstr., J. A. M. A. **98**:172 (Jan. 9) 1932.

Studies on Syphilitic Rabbits on Influence of Exclusion of Spleen on Antisyphilitic Efficacy of Arsphenamine. W. Frei and H. Fröhlich, Med. Klin. **27**:1571 (Oct. 23) 1931.

Study of Blood Picture in Congenital Syphilis and Effect of Antisyphilitic Therapy on Hemoglobin and Cellular Elements. H. H. Perlman and C. S. Wright, Am. J. Syph. **15**:449 (Oct.) 1931; abstr., J. A. M. A. **98**:170 (Jan. 9) 1932.

Syphilis of Bone Resembling Osteitis Deformans. L. B. Duggan and L. Bromberg, Am. J. Syph. **15**:538 (Oct.) 1931.

Syphilis of Pituitary Gland Producing Acromegaly. A. A. Werner, South. M. J. **24**:953 (Nov.) 1931.

Syphilitic Bursopathy of Verneuil. V. C. Garner and A. G. Schoch, Arch. Dermat. & Syph. **24**:591 (Oct.) 1931; abstr., J. A. M. A. **97**:1922 (Dec. 19) 1931.

Syphilitic Diseases of Eye. E. W. O'G Kirwan, Indian M. Gaz. **66**:560 (Oct.) 1931.

Treatment of Early Neurosyphilis. A. B. Cannon, Am. J. Syph. **15**:517 (Oct.) 1931.

Unusual Signs from Expansive Chiari Network Along with Signs of Syphilitic Aortic Regurgitation. J. A. Alvarez and G. Herrmann, Am. J. Syph. **15**:532 (Oct.) 1931; abstr., J. A. M. A. **98**:170 (Jan. 9) 1932.